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ABSTRACT

This report describes a set of procedures for conducting a literacy task analysis so that employers, educators, and trainers can understand the basic workplace training needs of employees. Four sections are included: (1) bridging the gap--demands, skills, and solutions in the United Kingdom, the United States, and Canada; (2) job, task analysis, and literacy task analysis; (3) results of the literacy task analysis; and (4) using the project results in different occupational sectors. The third section examines five case studies in the following job areas: motor vehicle repairer; grocery store receiver, retail sector; pre-cast repair and cleaning laborer; assistant grocery manager, retail sector; and butcher and butcher supervisor. Appendix A addresses the applicability of literacy task analysis to a variety of workplace situations in nine occupational sectors: (1) hospitality; (2) education; (3) financial; (4) retail; (5) manufacturing; (6) natural resources; (7) transportation; (8) construction trade; and (9) health care. Forty-one references are included. (NLA)

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BASIC SKILLS TRAINING
A Launchpad for Success in the Workplace

Literacy Task Analysis Project
Final Technical Report

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Adult Basic Education Department
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Preface

A little over a year The National Literacy Secretariat funded the Literacy Task Analysis Project in response to a need for business and labour to identify the basic skill requirements of different jobs in various sectors. The purpose of the project was to develop a set of procedures for conducting a literacy task analysis. These procedures would serve to help employers, union delegates, human resource personnel, trainers and adult educators better understand the basic workplace training needs of employees. As well, the literacy task analysis would provide a method for developing the actual training or retraining curriculum for workplace programs.

In this Technical Report an attempt is made to describe the nature of our work over the last year. We have tried to address the needs of two types of readers - the person with a keen interest in knowing more about workplace literacy and literacy task analysis and the person with an accomplished history in delivering skills training. This Technical Report is written as a background document to accompany the Manual and is divided into four chapters each with a different purpose and focus. Chapter 1 **BRIDGING THE GAP: DEMANDS, SKILLS AND SOLUTIONS** examines the role of education

and training as a solution to adult reskilling and upgrading, defines workplace literacy and describes a number of successful programs in Canada, the United States and the United Kingdom. For readers interested in a current overview of this evolving field of workplace literacy and its relation to training , this chapter may be useful. Chapter 2 **JOB, TASK ANALYSIS AND LITERACY TASK ANALYSIS** highlights the definitions, purposes and methods of job and task analysis as a foundation for understanding the dimensions of a literacy task analysis. Readers searching for a summary of the job and task analysis domain and current practices in performing a literacy task analysis may find this chapter beneficial. Chapter 3 **RESULTS OF THE LITERACY TASK ANALYSIS** describes, in case study format, five examples of how to conduct a literacy task analysis and points out directions for developing some of the training materials related to improving such a job or job cluster. Occupational sectors that are documented include automotive repair service, retail, construction and wholesale. The final chapter **USING THE PROJECT RESULTS IN DIFFERENT OCCUPATIONAL SECTORS** is an attempt to describe the applicability and usability of the various literacy task analysis methods in potential workplace situations.

This Technical Report and the companion "How to" Manual are intended for a variety of stakeholders, for whom literacy task analysis can provide significant new avenues for training.

For businesses, literacy task analysis affords the opportunity to target basic skills training to real needs in a job-specific context. It will help managers respond to training needs both for newly hired employees and for present employees whose jobs are changing because of the introduction of new technology or processes.

The union will also see a role for using literacy task analysis in their own training as a supplemental factor to the type of labour education which is already being carried out by a great many central labour bodies and their affiliates. Literacy task analysis can help workers who have identified job-specific training needs to gain greater confidence and satisfaction in the workplace as they improve the basic skills that relate to their own jobs or jobs to which they aspire. Empowerment of workers is the result.

With the help of business and labour, workers will be able to help their peers use literacy task analysis to get a fuller knowledge of the kinds of basic skills required to obtain a desired rotation, transfer or promotion.

For the service provider approaching training from a adult education or community literacy perspective, literacy task analysis

will create a comprehensive understanding of job duties and their contexts so that the needs of various job holders can be taken into account when designing effective curricula and programs.

In targeting this Technical Report to all these users, the authors hope that all stakeholders will gain a greater appreciation of the role of literacy task analysis as a workplace training tool, and that the report will point the way toward collaborative efforts and partnerships aimed at enhancing worker futures.

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Introduction

THE NEED FOR A SKILLED ADULT WORKFORCE

Canada, like many other industrialized nations, is learning that people drive economic growth and that future growth will depend more than ever on a highly skilled and adaptable labour force. The impact of changing world trade patterns and increased competition arising from falling trade barriers all point to one conclusion - the need for a skilled adult workforce. Recently there has been a growing awareness that the development of a flexible labour force is a national priority for the nineties. With this recognition comes acknowledgement that policy directions to improve our education and training system must be better linked to economic performance, productivity and worker satisfaction.

As a first step in addressing the parameters for improving this system it is important to examine the key trends that are shaping our labour market. Demographic transitions, employment shifts, workplace technology and rising skill requirements are

all part of a volatile mix of forces that are now creating a unique challenge for employers, workers and governments in developing a high quality workforce. In order to contextualize the strategy of workplace basic skills it may be useful to briefly outline these dramatic changes and economic conditions and discuss how they affect the demand for skilled workers in Canada.

Demographic Transitions

Over the next decade the ability of Canada's labour force to adapt to change will be affected by several demographic shifts. As a whole our labour force will grow more slowly. Two factors help explain this slow growth - low birth rates in the 1970's and the expected decline of the growth of participation of women in the labour force. (Employment and Immigration Canada, 1989).

With a slower population growth young people aged 15-24 entering the labour market will make up a smaller portion of the available labour supply. A recent report by the Advisory Council on Adjustment (1989, p. 22) stated that this age group

constituted approximately 26 percent in 1986 and is projected to decline further to 17 percent by the year 2001. It would appear that businesses will no longer be able to ignore candidates who are less well equipped and who are employment disadvantaged.

In years to come older Canadians will constitute an increasing proportion of the labour force. In 1986, 49 percent of the labour force was over the age of 34. By the year 2000 this figure will increase to almost 60 percent. Both of these demographic transitions have serious implications which will continue to be felt over the next decade. As Morrison and Rubenson (1989) point out, this means that future labour market demand for skilled workers will depend less upon new entrants and rely more heavily on the recurrent education of the adult work force.

Over the period 1966-1988 the proportion of women who participated in the labour force rose from 35 percent to 57 percent. (Canadian Labour Market and Productivity Centre, 1989). However, this rate of growth in participation will rise more slowly over the next decade in Canada as in other western economies. Groups who now face constraints to their full contribution to the labour force, such as native peoples and visible minorities, will require greater opportunities for training.

Employment Shifts

Today Canada's economy is increasingly dominated by the service sector which accounts for the largest number of jobs. Within this sector growth has been largely confined to two industries - wholesale and retail trade and community, business and personal services. This latter industry, which includes services to business, health and welfare services and food and accommodation, has accounted for 70 percent of net job growth in the eighties. (Canadian Labour Market and Productivity Centre, 1989, p. 5).

The Economic Council of Canada (1990) also points to the fact that virtually all of the recent employment growth has involved either highly skilled, well compensated and secure jobs or unstable and relatively poorly paid jobs. The polarization between the two groups is particularly marked in comparing the managerial, administrative, professional and technical service categories with the traditional service sector, (made up of services such as retail trade, hotels, laundry, cleaners, security and repair shops). The traditional services are characterized by lower skill levels, and even when jobs in this subsector are information based, they are

predominantly involved with routine data functions. The report refers to a growing segmentation in the labour market and the implication that the labour market is offering economic security to fewer Canadians.

However the growth of the service sector does not mean that manufacturing is becoming less important. Rather it is a reflection of the increased importance of services in the production process. With growing competition from newly industrialized countries, many Canadian manufacturers are shifting production toward higher value-added, specialized and information-based products. A wide range of jobs in high skilled services such as financial services, marketing and technical research as well as jobs in construction and retail sales depend directly on a healthy manufacturing sector. (Employment and Immigration Canada, 1989).

Predicting the sectoral shifts in the economy and the changing occupational structures is complex and difficult. But underlying all of these changes is the fact that knowledge has in effect become an essential national resource - and unless renewed on an ongoing basis, it quickly becomes obsolete. As numerous reports suggest, the move to a knowledge-based economy has important

educational and training implications. It means that learning must not stop after formal education is complete; rather it is a process that must continue throughout the course of a life time.

According to Torjman (1989) there are strong economic pressures for training to become an ongoing life-long activity. As well there is a growing consensus in Canada that training will be critical to maintaining our international competitiveness and to enabling our labour force to adjust to the impact of technological change.

Workplace Technology and Rising Skill Requirements

According to the Report of the Canadian Labour Market and Productivity Centre Task Forces on the Labour Force Development Strategy (1990), technological advances are significantly altering economic activity. The report points out that the effective application of new forms of technology will be the single most important source of job creation, wealth and value - added in the years ahead. In other words the emergence of a "training imperative" is crucial to ensure that the skills of both new workers and those already in the labour force are adequate to this new challenge.

Needless to say, the emerging technologies which are dominating changes in the workplace have serious training implications. To harness these complex technologies will require more sophisticated skills and knowledge for a significant segment of the labour force.

In many cases workers will be required to upgrade existing skills or develop a different and broader set of skills. Of all the jobs created between 1966 and the year 2000, 64 percent will require more than 12 years of education and training and almost half of these new jobs will require more than 17 years of education and training. (Employment and Immigration Canada, 1989).

It becomes increasingly obvious that these dramatic changes are calling for a different and higher and often broader range of skills in all sectors of the economy. With our labour force becoming older, and with shifts towards knowledge-based capital intensive industries and an exponential introduction of new technologies, different training strategies will need to be implemented. It seems apparent that Canada can no longer afford not to address the need for basic skills training for workers in almost all occupations.

Chapter 1

BRIDGING THE GAP: DEMANDS, SKILLS AND SOLUTIONS

The impact of adult skills deficits in the Canadian workforce has become increasingly visible. There now exists a growing gap between the demands needed in the workplace and the skills resident in the workforce. In order to move towards helping Canadian workers obtain the necessary skills needed for full productivity several key questions require discussion.

The purpose of this chapter, therefore, is to bring to the forefront some of these issues and concerns. First, how do business, labour, education and government view the role of education and training as a solution to reskilling and upgrading adult workers? Second, what is workplace literacy and how does it differ from general literacy? What are the skills required for an adaptable and effective workforce? Third, what kinds of workplace literacy programs exist in Canada, the United States and the United Kingdom and what are the characteristics that make them successful?

The Importance of Education and Training

Over the last few years education and training have been scrutinized and debated as the key to the future of the Canadian economy and to developing a world class labour force. However as demographic factors and economic conditions continue to create changes in the workplace, a new way of thinking about education and basic training for adults is necessary. Types of trainees, skills and competency requirements, appropriate learning environments, accessibility and financing are some of the factors which are part of the rethinking process.

It is clear that in order to preserve Canada's economic vitality effective strategies such as improving the role of education and training for all workers is a national priority. Leaders in business, labour, education and government are now more than ever required to bring education and training into concert with the workplace. It may be useful in this discussion to briefly review the current position of these key stakeholders on this question.

A recent survey by the Canadian Labour Market and Productivity Centre (1990) on issues dealing with education and literacy, and apprenticeship and training in the workplace indicated that business and labour leaders recognize that the top priority for improving international competitiveness is training and education.

Overall 60 percent of the leaders surveyed said that education and training and human resource policies are either the first or second most important factor in improving competitiveness. In addition one third of the business leaders and one half of the labour leaders state that illiteracy is a problem among the Canadian workforce. Many business leaders say that illiteracy has at least occasionally affected their industry with the impact being lower productivity. However, they also indicated that higher training costs, quality control problems and recruiting difficulties are other factors often associated with illiteracy in the workplace.

In a study by the Conference Board of Canada entitled ***"The Impact of Employee Illiteracy on Canadian Business"*** almost three quarters of the 626 companies surveyed felt that they had a significant problem with functional illiteracy in some part of

their organization. Twenty-six percent of the employers reported that illiteracy has slowed down the introduction of new technology, and 34 percent indicated that illiteracy has impeded training and the acquisition of new skills. In addition, forty percent of the companies observed the effects of illiteracy in errors in inputs and processes in production, and 32 percent of the companies felt that they could associate some productivity losses with literacy deficits in their organizations. Results of the study also suggested that the sector with the most acute problems of functional illiteracy was the restaurant, accommodation and hospitality sector. The sector reporting the fewest problems was the financial sector.

As DesLauriers (1990) maintains, several trends have emerged from this research. In the first place many companies have been moving in the last few years to deal with functional illiteracy in the workplace. Some have put human resource policies and programs in place to upgrade basic skills on a broad basis, while others have taken specific actions to deal with specific situations. However, even as those successes are being registered, the goal posts are moving down the field. As the rate of technological change increases, it will become ever more critical for employers to be able to retrain and redeploy their workforce with rapidity and ease. For that to happen, the general level of literacy in the workforce must increase (p. 11).

The Canadian Chamber of Commerce also believes that education and training are vital to the interests of all employers and employees across Canada. In the ***Report of the Task Force on Education and Training*** (1989) the authors confirm that many businesses have already realized that to gain the skilled workers they need, their only option is to become more active in training and education. They also maintain that small and medium-sized firms, as well as large firms and organizations, must undertake a better training effort. Of particular interest to this discussion, the report strongly recommends that Canada's education and training thrust should emphasize general skill development. The authors purport that good basic education and training should be viewed as an essential complement to job-specific skills.

As well, Employment and Immigration has strongly voiced the need for better education. They are now developing a national strategy which will focus on increasing the level of training and skills development and maximizing opportunities for all members of the labour force. The report ***Success in the Works*** (1989) states that workers beyond school age who are already in the labour force will represent the largest portion of workers in the year 2000. However almost 60 percent of these workers have secondary school

education or less. This suggests that a large portion of the workforce now and in the future lacks the educational preparation and training for the majority of new jobs in the 1990's - unless their education is supplemented with substantial vocational training to acquire new skills.

In addition, the lack of skills and education is also a barrier to re-employment. During 1988 approximately 1.1 million job seekers experienced difficulty in finding work as a result of a lack of skills, while 800,000 identified a lack of education as restricting their employability. (Employment and Immigration Canada, 1989, p. 21).

Provincial governments have also developed strategies for improving skills training. Ontario with its open, diverse and large industrial base has called for a new training system and has already put into place the foundation. For example, since 1984-1985 the province has nearly doubled its allocation to training and work experience programs. The report ***Building a Training System for the 1990's: A Shared Responsibility*** (1989) advocates an effective and positive system where adult workers can undertake training and retraining throughout the next decade. The report

recommends that in the future labour market in which there will be decreasing opportunities for low-skilled work, it will be increasingly important that all workers have at least a basic level of skills including literacy and numeracy. Such a foundation will be essential to enable workers to undertake vocational and higher skills training.

In a similar vein, the document ***Ontario's Labour Market: Long Term Trends and Issues in the 1990's*** forecasts that more firms will encounter problems when they introduce new technologies or implement changes in the organization of work because their employees' basic skills are inadequate. The new technologies mean that tedious and repetitive semi-skilled or unskilled tasks and those that require substantial physical strength are replaced by requirements to read instruction manuals, take measurements, use computer key boards to input information, and understand statistical reports. To make the transition, many workers will need to strengthen some of their basic skills. In other words, upgrading will become more urgent. (Ontario Ministry of Skills Development, 1990, p. xiii).

As education and training take on a new importance among the major stakeholders in promoting a more productive and competitive economy, it will be necessary to improve the mechanisms for delivery. Employers are now reporting difficulty both in hiring skilled workers and finding level-entry applicants who can read and write well enough to participate in company training programs. If this is the case then what is required is a new approach to skills training - a focus on the basics through workplace literacy programs.

A Literacy Definition for the Workplace

Any attempt to learn about the magnitude and severity of literacy, either general or in the workplace, seems to raise the need to define it in a concrete and realistic way. Depending on which national estimates of illiteracy are used, definitions vary. In fact over the last fifteen years a debate has evolved around this issue. On one side of the debate are the "literalists" and on the other side the "contextualists". (Chynoweth, 1989, p. 13).

The "literalists" argue that if one can read and write short, simple statements relating to everyday life, one is literate. Literacy programs that register student's progress in reading levels reinforce this definition of literacy. Reading level definitions seem to be easily understood and can be tested by paper and pencil tests. As well individuals can be grouped, tracked and counted. This type of definition also appears to be compatible with grade level completion. However, successfully completing the tenth grade does not guarantee a tenth grade reading level. In addition, a grade 10 certificate does not insure the skills or abilities needed to function in the labour market which is changing rapidly and growing ever more complex.

The "contextualists" on the other hand argue that individuals are literate only if their reading, writing, computation, reasoning and communication skills match the requirements of their environments. Literacy programs that measure individual progress in terms of functional competency development support this view of literacy. The expected outcome of literacy improvement using this definition is not an academic reading level but competency adequate to a particular context such as the workplace.

Contextual definitions may be more relevant for employers and employees but they are not easily communicated or understood by the public. By definition they are difficult to standardize and tests are expensive to develop and use. In addition the context for literacy must be specified each time one uses a functional definition.

However, despite these limitations a contextual definition may be more useful in the development of basic skills programs. Coupled with the fact that there now exists a mismatch between workers' skills and jobs, employees must see immediate and practical value in instruction if they are to be attracted to programs, retained in them and eventually enabled to improve their jobs.

In job-related literacy training the individuals self-perceived need and employer goals are very likely to converge. Both employees and employers are interested in improving job performance. Therefore, by focusing on the context and specific job requirements, decisions on content and program approach can more effectively be made.

Literacy for the workplace means interpreting computer print-outs from an engine diagnostic machine. It means making gross profit calculations on a shop floor. It means following directions when using workplace hazardous materials. It means using time management skills when unloading delivery transports. It means measuring pipes to specification. It means understanding a circuit wire diagram when repairing a VCR. It means giving directions to a night crew clearly and succinctly so that they can easily be followed. It means explaining to a customer why there is a delay. It means ordering inventory and checking for parts using a computer terminal.

In the mid 1990's employers seemed to say that the most important skills for any employee were the basic academic skills of reading, writing and arithmetic. But more recently there has been a recognition that these skills are only the tip of the iceberg. According to Askov (1989) workplace literacy may be defined as the written and spoken language, basic communication, computation, thinking and problem-solving skills that workers and trainees use to perform job tasks or training. This type of operational definition provides a more concrete framework for better understanding the competencies necessary to work effectively and efficiently in the labour market of the 1990's.

Differences Between Workplace and General Literacy

To begin with, workplace literacy and general literacy differ in purpose and application. The demands for literacy in the workplace are considerably divergent from the general literacy requirements such as those encountered in high schools and in vocational training. Research has revealed that the uses of literacy on the job appear to be much more complex than the typical uses of literacy in schools.

In order to thrive in the work force individuals must possess certain basic skills. However many high school students and trainees are unprepared for how these basic skills are used in the workplace. Most job-related reading, writing and computation is done to accomplish tasks and make evaluations about the usefulness of material. Rather than reading from a single text workers must gather information from several sources to solve problems, provide services and perform tasks. This is in contrast to the school environment where the student is reading primarily to gain literal facts.

According to Mikulecky, Ehlinger and Meenan (1987) literacy in the workplace relies heavily on extralinguistic cues and makes use of social systems. Workers often move back and forth from print to equipment and then perhaps back to a different piece of print. Workers read, observe, do and interact with others. The social aspect of asking and discussing is highly important. On the other hand, students and trainees read primarily to obtain information and gather facts. Writing is used to take notes, answer exam questions and to copy information. More emphasis is placed on producing a standardized written product and less on solving problems, communicating ideas or accomplishing tasks.

Rush, Moe and Storlie (1986) have also indicated that trainees in vocational training programs used reading-to-learn and reading-to-do strategies giving little attention to reading-to-assess skills. Analysis of "whether, when and how" to use reading materials, which is a crucial occupational reading skill, was not practised in the training programs. As well, oral language in the classrooms and laboratories was observed to be less social than was the case at the job sites. The researchers also stated that students read mostly textbooks, reference books and chalkboard notes which were very different from the types of materials read on the job.

Similar findings were reported by Taylor (1989) in a study that investigated the literacy requirements of the more basic vocational training programs and corresponding occupations. Writing skills were used by trainees for note taking, assignments and examinations. The style of writing was formal which was different to the more informal style used in the workplace. In terms of reading skills, trainees read mostly textbooks, reference books and course handouts. On the job workers tended to read technical references, working practices, policies and instructions, handbooks, tabled information, diagrams, memoranda, correspondence and training manuals.

Mikulecky (1982) examined the literacy demands and competencies in the daily reading of high school students, technical trainees and workers. The purpose of the study was to determine the extent to which literacy, as it is encountered in schools, is a preparation for various occupational literacy demands.

The results seem to suggest that students read less often in school than most workers do on the job. Students read textbook

material primarily to learn, whereas workers read for a number of purposes including reading to learn, do and assess. As well, workers encounter a much wider variety of print material which they can orally discuss and apply with greater comprehension. The researcher also concluded that workers viewed reading as more important to their success and did considerably more reading for application than technical school students. It is interesting to note that in this study the difficulty levels of work materials were generally as difficult or more difficult than high school materials.

In another study Mikulecky and Winchester (1983) investigated job literacy and job performance among trainees and levels of workers in a health occupation. They found that there were significant differences between the kinds of literacy abilities called for in most training classrooms and the kinds of literacy abilities used on the job. Reading and writing on the job were consistently used as tools to complete tasks and solve job-related problems.

Another interesting result was that master performers differed from their adequate counterparts mainly in their ability to think through what needed to be accomplished and then applying their

reading and writing abilities to efficiently complete job tasks. Master performers knew when to skim, when to look for new information, when to check a reference and how to find ways to organize notes and information to better do their job. Trainees appeared to be less competent at higher level abilities such as summarizing and dealing with unfamiliar material.

Using a similar approach but in the electronic technician occupation, Mikulecky and Ehlinger (1986) studied the influence of metacognitive aspects of literacy on job performance. Three employment levels (training, experienced and supervisory) were examined. In summary, trainees spent more time than experienced and supervisory employers performing job-related reading which was problem related. They also read most often to learn in the process of performing tasks.

Master performers whether they were supervisors, experienced technicians or trainees were better able to identify key concepts, summarize key ideas and provide details related to key concepts. They were independent and able to operate on their own. In addition they tended to develop their own sophisticated information retrieval systems. Higher level metacognitive and problem-solving reading abilities such as monitoring, focusing, and managing information consistently and significantly correlated to job performance.

Several major conclusions can be drawn from the preceding research studies and investigations. The literacy skills needed to perform successfully on the job are different than the general literacy skills taught in high schools and vocational training programs. It would appear that workers read a variety of materials on the job whereas students tend to read one type. Also, job-related reading is for problem-solving and making applications which is a different focus than the use of reading in schools. Finally, workplace literacy calls for regular use of higher-level application and metacognitive reading skills while school and training reading is predominantly fact gathering.

Workplace Literacy Requirements

In a recent policy paper entitled ***Workplace Competencies: The Need to Improve Literacy and Employment Readiness***, Barton and Kirsch (1990) maintain that the typical discussion of workplace literacy needs usually focusses on formal education or on literacy. Although these are very important considerations they are just one

component of the ability required to function in the modern workplace. Over the last few years, a number of convincing studies have furthered this discussion on workplace literacy requirements by identifying the basic skills individuals need in order to enter and progress in the workplace. Although not exhaustive, the next section will highlight some of those investigations.

In one study, Hull and Sechler (1987) examined the nature and extent of adult literacy needs in several U.S. corporations. In the investigation skills were identified through a review of literature, site visits to industry-based training programs and consultation with a technical panel of experts.

Results from the study indicated that basic literacy skills often serve as prerequisites to the learning of more technical knowledge. This knowledge is specific to types of equipment and industries but the underlying skills tend to be somewhat generic. Company managers, instructors and union trainers reported that the types of skills needed to enter and progress on the job could be classified into five major categories: mathematics, reading, writing, listening and speaking.

Basic workplace research conducted by the American Society for Training and Development and the U.S. Department of Labour also examined the skills needed in the workplace. Carnevale, Gainer and Meltzer (1988) indicated that more recently employer complaints have focused on serious deficiencies in areas that include problem-solving, personal management and interpersonal skills. They also cited the abilities to conceptualize, organize and verbalize thoughts, resolve conflicts and work in teams as critical areas.

In a pioneering attempt to conceptualize the skills employers want the researchers developed a framework which consists of seven skills groups. These groups include:

1. ***learning to learn***
2. ***3R's (reading, writing and computation)***
3. ***communication - listening and oral***
4. ***creative thinking and problem-solving***
5. ***self-esteem, goal setting - motivation, personal and career development***
6. ***interpersonal, negotiation, teamwork and,***
7. ***organizational effectiveness, leadership.***

The authors propose that this framework is a prescription for a well-rounded worker who has acquired a number of discrete skills and who has the ability to acquire more sophisticated skills when necessary.

In an effort to meet the work readiness needs of employers, Pestillo and Yokich (1988) developed a working construct of employability skill categories. The purpose of the initiative was to identify those skills and behaviours employers believed to be important across a broad range of business, service and industrial sector jobs. A second purpose was to inform current and future workers of employers' expectations. Given the wide variety and complexity of jobs in the labour market the skill bands were generic in nature. For effective performance in a changing workplace five categories were developed: academic, personal management, career mobility, group and organizational effectiveness and adaptability.

Recently in a Canadian context the Ontario Ministry of Skills Development surveyed 329 employers across nine industrial sectors ranging from manufacturing to service hospitality. According to Shields, Embree, Taylor and Wallace (1989) the purpose of the investigation was to develop a training profile reflecting the skills, competencies and tasks actually performed in the workplace.

The goal of the project was to develop an integrated curriculum accommodating the basic training needs for three broad client groups:

a) ***those bound directly for employment***

b) ***those wishing to qualify for skills training or apprenticeship and,***

c) ***those wishing to qualify for post-secondary programs.***

Occupational literacy skills needed to enter and progress on the job were classified into five major categories: communications (reading, writing and other linguistic competencies), mathematics, science, computer literacy and work adjustment.

Together these studies provide a clear indication of the basic skill categories required of trainees and employees to either enter the labour market or perform effectively on the job. There also appears to be a general consensus that within each major category or group there are articulated lists of specific skills. As Hull and Sechler (1987) point out skill lists are critical tools for

personnel managers, industrial trainers and workplace literacy instructors. Basic skill lists help these people:

a) ***relate changing job requirements to needed employee skill levels***
b) ***assess the skill levels of job applicants and existing employees to determine how well those skills match the job requirements for hiring and advancement***
c) ***identify both group and individual basic skill deficiencies in order to place workplace literacy training programs, and,***
d) ***to analyze the effectiveness of such courses or programs.***

Based on the findings of the previously discussed research on workplace literacy requirements an attempt has been made to develop a ***Basic Skills Profile*** (Figure 1). This profile is a compilation of the major skill categories with examples of specific skills drawn from evidence in Ontario workplace. The full range of specific skills are not included here but rather only those most frequently cited by employers. The profile may serve to provide a framework for examining the results of a literacy task analysis and in the development of job specific training curriculum for workplace literacy programs.

FIGURE 1

A Basic Skills Profile

1. Basic Literacy and Numeracy Skills (reading, writing and computation)

   * Read notes, job orders, schedules, charts, regulations and instructions.
   * Read to determine facts, opinions or implied meanings.
   * Write short notes & single paragraph letters.
   * Complete forms using figures, short phrases and sentences.
   * Use the basic number operations.
   * Recognize geometric figures.
   * Estimate how long it will take to do a job & measure metric units.

2. Basic Listening and Oral Communication Skills

   * Receive facts or directions.
   * Understand opinions, purposes or implied meanings.
   * Give information.
   * State possible reasons which might cause certain faults or symptoms.

3. Creative Thinking and Problem-Solving Skills

* Ask probing questions.
* Use reference manuals.
* Establish a priority or sequence in checking for problems.
* Solve numerical problems in word form.
* Show information.
* Implement solutions.
* Track and evaluate results.

4. Personal Management Skills (skills related to developing the attitudes and behaviours required to keep and progress on the job)

* Know company policies and practices.
* Know employer/employee expectations.
* Time management.
* Showing initiative and suggesting new ideas for getting a job done.
* Learn new skills and ways of doing things.
* Know the basic workplace hazards.
* Care of equipment and materials.

5. Teamwork Skills (skills needed to work with others on the job)

* Work with supervisors and co-workers.
* Stick to a schedule.
* Decision making skills.
* Giving directions.
* Giving feedback.
* Identify with the goals, norms, values, customs and culture of the group.
* Exercise "give & take" to achieve group results.

Workplace Literacy Programs

Workplace literacy has developed in a variety of ways, depending on the location, the sector and the motivation behind the training. As discussed in the next section the Canadian, American and United Kingdom experiences have differed significantly. In order to assess how workplace literacy programs may benefit from a literacy task analysis exercise, it may be useful to highlight some of the programs which are presently in operation and outline their major elements.

The Canadian Experience

FRONTIER COLLEGE, with its history of basic skills instruction in mining communities and remote work camps, dating back to 1899, was probably the first voluntary association to provide literacy instruction in a working environment. Its modern day program, Learning in the Workplace, has extended the tradition into an urban context. Frontier now provides employers with workshops and "train-

the-trainer" sessions on workplace literacy, covering a wide range of topics such as diagnosing literacy needs in the workplace, carrying out organizational needs assessments, recruiting students and teachers and developing learning materials. In addition, Frontier offers employers consulting services, plain language training and editing and the production of learning materials. A wide variety of companies, with mandates ranging from automotive to steel and from meat packing to forest products, have participated in Frontier's program which is funded through government.

THE BASIC EDUCATION FOR SKILLS TRAINING (BEST) PROGRAM OF THE ONTARIO FEDERATION OF LABOUR provides an example of a labour based literacy program conducted in the workplace. In 1988, with funding from the Ontario Government's Ministry of Skills Development, the Ontario Federation of Labour set up a "peer-tutoring" literacy model in workplaces across Ontario. Trainees are employed or unemployed union members, and instructors are rank and file trade union educators who have been trained by BEST staff. Classes are held in the workplace or in nearby union or community halls. Many are offered partly on employer's time. With a learner centered approach, instruction is based on subjects which the

learners wish to address, ranging from health and safety in the workplace to getting help in filling in forms or understanding children's report cards. BEST, essentially a community based program delivered in the workplace, has several major strengths. The strength of the Ontario Federation of Labour has led to the program accessing a large number of workplaces in a relatively short time. It has also led to a heightened awareness of literacy issues by employers. Indeed, literacy has become an issue around which both management and labour can coalesce. With a headquarters in Toronto and regional offices in Brampton, Guelph, London, Orillia, Ottawa, Timmins, Thunder Bay and Welland, BEST is well positioned to offer its services throughout the whole province.

The LAUBACH LITERACY INDUSTRIAL TUTORING PROJECT was funded by the Canadian Employment and Immigration Commission (CEIC) as a pilot project under the Innovations Program, and began in January, 1987. Laubach Literacy began in the Phillipines in the volunteer literacy sector and is named after Frank C. Laubach, a missionary in the Protestant Congregational Church who began a phonics based literacy approach which evolved into the Laubach Way to Reading Series which has been used in many countries.

The Industrial Tutoring Project was born when the owner of a small fish processing plant in the Maritimes approached Laubach Literacy in an effort to obtain literacy upgrading for his workers. Building upon its experience with the voluntary sector and the Laubach "Each One Teach One" theme, the Industrial Tutoring Project is based on recruitment and training of tutors who are ideally recruited from the workplace. St. Catherines, Ontario, Winnipeg, Manitoba, and Cape Breton, Nova Scotia became the main focal points for this program. Using Laubach Literacy Councils in each province as a means of recruitment and outreach, over 7400 tutors have been trained nationally for a variety of Laubach Literacy programs. In regard to the Industrial Tutoring Project, as of April 1990, project statistics showed that there were 205 trained tutors from industry, 379 learners from industry, and 38 new participating companies.

The Industrial Tutoring Program teaches employers to develop and coordinate their own workplace literacy programs, provides program coordination for employers, and supplies tutoring for specialized workplace environments to suit ESL needs, company downsizing and response to production changes.

THE ROYAL COLUMBIAN HOSPITAL in Vancouver is the site of another partnership model of workplace literacy, funded jointly by the Federal Government and the Government of British Columbia. The partners are the hospital's management, the Hospital Employees' Union and Douglas College of New Westminister. The program was set up to assist cleaning staff, orderlies and dietetic aides, some of whom had difficulties in such job tasks as reading menu plans and food choices or reading directions for solvents. Using a room distant form the wards where employees worked, participants had an on-site program, but one which allowed a high degree of independence from their normal work situations.

Classes were scheduled to overlap two common shifts, with participants coming either before or after their working hours. The program was presented as a basic skills upgrading program, and extensive pre-planning went into its marketing. Both union and management support of the project was secured at the outset through contact with the British Columbia Federation of Labour and the Hospital Employees' Union as well as the hospital's management staff, including the Director of Employment and Compensation, the Director of Personnel and the Labour Relations Analyst. The instructor for the project was hired by Douglas College. Initial work with course design, recruitment and assessment paved the way for the actual implementation of the program.

Boards of Education have also shown an interest in workplace literacy initiatives. The SCARBOROUGH BOARD OF EDUCATION provides an example of workplace classes offered to business, industry, government and labour organizations. In co-operation with employers and employee groups, Workplace Classes (WPC) staff design and deliver classes at the workplace, before and after shift, for workers and supervisory staff. WPC aims to assist organizations to adapt to a changing workforce ard to upgrade employees to meet the technical needs of today. In tailoring courses for clients, the instructors of WPC visit the shop floor, probing machines and manuals, and photographing equipment and processes, so that the course design will reflect the reality of a specific workplace rather than generalities. Through Workplace Classes, the Scarborough Board has also built linkages with the Scarborough Business Industry Education Council, showing the kind of further outreach that workplace literacy classes can engender.

The JOB EFFECTIVENESS TRAINING (JET) program run by the Alberta Vocational Centre exemplifies a multi-faceted approach, concentrating on detailed preparation in order to obtain the appropriate curriculum and instructors. Beginning with needs assessments, made up of interviewing, observation and photographing work processes, JET established a three level, one hundred hour

course for employees at the Stelco Steel Edmonton Works. The competency based curriculum sets out the exact tasks that each student must master in order to reach the required competencies which had been determined in a DACUM (Developing a Curriculum) workshop. Terminal performance objectives relate to seven main areas of worker need - Adjusting to the Job and Co-Workers; Learning and Thinking; Listening and Speaking; Reading; Writing; Mathematics; and the Workplace Hazardous Materials Information System (WHMIS). Workers attending the JET program attend classes once a week for five hours on their day off after completing a four day shift. Half the time is sponsored by Stelco Steel, whose management has taken a great interest in the program, and indeed has participated in the program through arranging class visits to major contractors. Classes are held at the Alberta Vocational Centre in order to allow for a one hour session each week in the computer lab. The course instructors were trained through two 30 hour Train the Trainer workshops which brought about a pool of 40 qualified instructors. The 12 Stelco employees who just graduated from the first JET program in April, 1990 are enthusiastic and asking for further upgrading.

As in the JET, BEST and Frontier programs, Train the Trainer has been a major component of getting a workplace literacy program

up and running. The Literacy Institute has proven to be an effective way to provide workplace literacy training to literacy practitioners who wish to extend their experience from a school, college or community venue to the completely different atmosphere of the workplace. THE GEORGE BROWN COLLEGE LITERACY INSTITUTES funded by the Ontario and federal governments in April and May 1989 aimed at increasing participants' awareness of communication issues in the workplace. Topics covered in each of the two week sessions held at the Adelaide Street Campus of George Brown College in Toronto included organizational needs assessments, the design and implementation of workplace literacy programs, and marketing and evaluation strategies. Each of the 60 participants was asked to prepare a post-Institute practicum. One such practicum from a London, Ontario participant outlined a project completed at an automotive parts manufacturing company. The report included information about the needs assessment, the use of questionnaires to supervisors, analysis of information and the preparation of both general and job specific material. The participant credited the Institute with expanding her horizons regarding the step-by-step process in designing a training curriculum. The Literacy Institute concept is now expanding to other provinces and can be viewed as a practical and useful way to build bridges among labour, management, educators and government.

The Nova Scotia Department of Advanced Education and Job Training has initiated a workplace upgrading applied research project that currently includes several workplace programs. One program, at a NOVA SCOTIA DAIRY COMPANY, introduced a 16 hour course to 10 of the 32 employees. The program was given at a local high school on Tuesday nights, with each session lasting two hours. The Workplace Hazardous Materials Information System (WHMIS) Guide was used to improve the reading of technical material, while arithmetic skills were developed through the study of metric measurements. Material on daily plant sanitation was used to help workers to write short reports. In the program, emphasis was placed on job related knowledge and skills rather than generic academic skills. Another program was set up for workers at a NOVA SCOTIA PEWTER AND SILVER SOFTWARE COMPANY. A 16 week program of 64 hours was established for 22 participants. The course takes place at the employer's Resource Centre on Mondays and Wednesdays from 3:30 to 5:30. The course contains four modules, designed to develop written communication skills, to achieve clarity and variety in written expression, to improve reading comprehension, and to prepare for a GED. Most of the participating employees have been out of school for 10 years or more. The Nova Scotia Department of Advanced Education and Job Training assumes the instructor's cost. The employer provides training facilities in the workplace and pays one hour of each session, (32 hours) with the employees offering their time for the remaining 32 hours.

The literacy initiatives outlined above are indicative of the various basic skills programs which can be found in Canadian workplaces in every province and territory in Canada. It should be pointed out, however, that such initiatives represent a small part of the Canadian training picture. Yet, through this type of partnership building, literacy training can become an integral part of other workplace training, providing a more solid base both for economic growth and for individual achievement.

The United States Experience

The United States has been engaged in industry-based training and in workplace literacy over the past several decades and has devoted major funding through the Job Training Partnership Act and other legislation both at the state and national level. The Job Training Partnership Act provides a decentralized approach, with governors managing at the state level, using state criteria and giving planning guidance to the local areas. Contracts are given to schools, community colleges, educational institutions and other relevant groups. The 1.7 billion dollar program under Title 2A of

the Job Training Partnership Act which is targeted toward the economically disadvantaged is an example. It provides formula money to the states to allocate to Local Service Delivery Areas (LSDAs). The Governors designate local Private Industry Councils (PICs) with a high concentration of business members willing to contribute to literacy upgrading initiatives within their organizations.

The Employment and Training Administration of the Department of Labour in Washington has developed a "cluster" approach to the projects which it funds. Cluster 1 is devoted to groups such as low income and single support individuals, school dropouts and Hispanics. Cluster 2, which involves companies for the most part, is targeted toward the development and testing of instructional techniques, mostly computer assisted, and interactive video, while Cluster 3 projects relate to assessing and diagnosing basic skills deficits.

The Department of Education has a Workplace Literacy Program which provided 9.5 million dollars to 37 projects in 26 states in 1988. Congress raised the appropriation to 11.9 million in 1989.

The program, set up by Section 371 of the Adult Education Act, authorizes the Secretary to make demonstration grants for job related programs of literacy and basic skills that result in new employment, continued employment, career advancement or increased productivity of workers. Grants are provided to partnerships only - one or more partners coming from a business, industry, labour organization or private industry council, and the other or others coming from a State or local educational agency, an institution of higher education or school (including an area vocational school, an employment and training agency, or community based organization).

A number of key initiatives sponsored by Government combine to create a favourable atmosphere for the improvement of basic skills. The Labour Investing for Tomorrow (LIFT) Program has established a series of awards for outstanding practice. One award is for skills training. In addition, the Secretary's Commission on Basic Skills, known as the SCANS Commission, will establish guidelines on the skills needed for various occupations, and schools can then endeavour to meet these skills in educational programs.

The following examples of some specific workplace literacy progams indicate the wide range of approaches to basic skills in the workplace.

THE STRUCTURED WORKFORCE LEARNING DEMONSTRATION PROJECT - One and a half million dollars has been granted to THE NATIONAL ALLIANCE OF BUSINESS by the Department of Labour to give a structured process for entry level workers. Based on the apprenticeship model, a concept which has been mostly confined to the building trades and blue collar jobs, the demonstration includes Motorola, Eastman Kodak and the American Bankers' Association. Within this project, the banking industry has identified basic skills for various banking jobs and has prepared a Job Skills Hierarchy.

In Lafayette, North Carolina, BLACK AND DECKER, in conjunction with a community college, are offering ABE/GED in a trailer. Video tapes and interactive computer are used with functional context manuals. This program was initiated after Black and Decker moved their plant from Hampstead, Maryland to a more high tech area where statistical process control was important. A "pre-math" course geared toward statistical process control was the first step, with other basic skills soon following. An advisory committee was required by the grant, and in the North Carolina case the committee was large, with over 50 people, many of them being adult educators and front line supervisors. The program launched through this partnership resulted in fewer customer complaints and less wastage.

Trades training has been a focal point in initiatives launched by various unions. STEELWORKERS have a program in five companies, of which BETHLEHEM STEEL is one, which cost 14 million dollars in each of five years. PLUMBERS AND PIPEFITTERS' instructors receive instructor training at Perdue with a view to learning new ways to teach mathematics and other basic skills. Other union approaches involve consortia, such as the NEW YORK CONSORTIUM FOR LITERACY which includes eight unions and which highlights interactive video for union members.

POLAROID CORPORATION. The Polaroid approach to basic skills upgrading was developed in response to the need to assist employees working in the Corporation's labour intensive assembly line operations. In 1970 an in-house program was developed featuring ABE, GED and ESL components. Two programs were developed for hourly employees, focusing on pre-technical skills and basic remediation in basic skills. Fundamental Skills tutorials, classes and labs are offered in basic mathematics, ESL, reading and writing, according to need throughout the company. Job related basic skills criteria have been established for all hourly positions, and literacy, ESL and basic mathematics assessments have been developed and correlated to job tasks and training programs.

The Technological Readiness program provides hourly employees with additional skills in science, mathematics and computers. The two hour sessions take place at the beginning or end of the shift, and program time is shared between employer and employee.

THE MASSACHUSETTS WORKPLACE EDUCATION PROGRAM. This program, developed at the request of Governor Michael Dukakis, is one of the first long-range planning models that links literacy to clearly defined job market needs. The program is jointly supported by the Department of Employment and Training, the Department of Education and the Executive Office of Labour. Immigrants, refugees, low income and potentially dislocated workers were among the target groups for this three year demonstration project which consists of twenty programs in approximately forty worksites. The following initiatives are part of the Massachusetts Workplace Education Program. Laundry and Drycleaning Union, Local 66 set up a program to instruct their largely immigrant/refugee membership on how to handle hazardous workplace materials, and how to qualify for higher paying jobs through greater language skill acquisition. The Franklin/Hampshire Employment and Training Consortium provides machine shop and paper mill employees with high school equivalency. Friction Materials Ltd., in partnership with the Lawrence Public

School's Adult Learning Centre, provides workers with adult basic and ESL instruction, with five hours of paid release time per week. The Bristol County Training Consortium is a partnership between the Labour Education Centre at Southeastern Massachusetts University ant the Needle Trades Action Project. The Consortium developed a program to develop the region's apparel industry through a literacy skills program focusing on work and union related curriculum materials.

ONAN CORPORATION. Onan Corporation is a world leader in the manufacture of portable and stationary generators, and gasoline and diesel engines. In 1982, spurred by accelerated technological change, Onan introduced a comprehensive on-site program that included basic education and pre-technical courses. The courses in communications (reading, writing and study skills), computers, and mathematics served as prerequisites for increasing technical skills in the mechanical, electrical and quality assurance areas. Part-time instructors for the program were supplied through the school district in the area. Classes were scheduled for fifteen weeks and held in various plant lunch rooms once a week in two hour sessions immediately after or before shift. While no formal credits for the courses are awarded, the success of the program has been assessed by both instructors and trainees.

The United Kingdom Experience

The British Workplace Literacy experience has been shaped by the work of the Adult Literacy and Basic Skills Unit (ALBSU) and by a number of decentralized project approaches which have taken place in England and Wales with the help of this organization. ALBSU, initially set up for a three year period in 1982, has proven invaluable as the central focus for adult literacy and basic skills in England and Wales, and has seen its mandate extended and expanded over the past five years. ALBSU has taken the view that literacy training should not be conducted only by traditional literacy providers, but rather should also encompass providers with a wide variety of mandates. In the workplace this approach has led to a number of business, labour, government and education partnerships.

THE ALBSU AND MSC PARTNERSHIP. A partnership between ALBSU and the Manpower Services Commission (MSC) provides an example of how demonstration projects have led to a fuller understanding of literacy needs of the unemployed and the under-employed. Among pilot projects commenced in 1988, were courses in Hull and Telford which provided 20 weeks of training aimed at helping trainees

improve their basic communication skills while at the same time focusing on local employment opportunities. Other ALBSU and MSC projects developed literacy elements within Work Preparation Courses geared toward specific work situations. These projects indicated that basic skills instruction offered within a work milieu and providing a route for further training or employment, was much more attractive to adults than basic education courses which did not have an employment aspect.

WORKBASE. Since 1978 Workbase has been promoting and providing basic education courses in work time, on work premises for manual workers. Probably the best known of all British workplace literacy initiatives, Workbase has supplied the model on which some successful American and Canadian programs have been built. Workbase offers a number of services, including Train the Trainers, advice on setting up workplace courses, and assistance on program design. A key aspect of Workbase is its emphasis on trade union involvement as an essential element of success. Indeed, trade unionists started the project, and getting employers to recognize the needs of manual workers has been a major goal in Workbase's development. Workbase has helped many organizations to address the basic skills needs of their employees. Among them are BBC Radio, The London Fire Brigade, The University of London, The London Borough of Westminister and the Leeds City Council.

THE BASIC SKILLS ACCREDITATION INITIATIVE. The Basic Skills Accreditation Initiative is sponsored by the BBC, the Employment Department and Training Agency and ALBSU and is based on a study carried out for these agencies during August 1988. The study recommends an approach to certification in adult literacy and numeracy to respond to a wide variety of different un-coordinated practices currently in effect. The idea is to establish a context-free set of "core area outcomes" which could be applied to various industries. The certificate resulting from the initiative would have transferability across vocational areas and would build bridges between education and training. Certificates in literacy and numeracy envisaged under this initiative would be based on curriculum guidelines developed for each industry with its active involvement in the process. Industries would include hotel and catering, construction, engineering, road transport, and retail. A wide range of delivery bodies such as colleges, community providers, companies and industry training centres and schools will be encouraged to offer the certificates. The role of broadcasting is recognized as an important motivator and delivery mechanism. The transferability of credit accumulation from one vocational context to another is seen as the major strength of the Basic Skills Accreditation Initiative, since it will permit workers to

achieve recognition for skill competencies and to transfer these competencies from one work setting to another with minimum disruption. The Basic Skills Accreditation framework has been completed for two levels of communication skills - reading and writing, and listening and speaking. Students have now received certificates. Work on two further communication skills levels is in progress, and were field tested in October, November 1990.

The Need for Literacy Task Analysis

Case studies of workplace literacy and industry-based training programs in Canada, the United States and the United Kingdom suggest several conclusions relating to general principles of practice. First, successful programs tend to combine relevance to the organizational goals with worker perceptions about what will benefit them personally on the job. In many cases both employer and employee recognized that a proficiency in basic skills would allow them to acquire more technical skills.

Second, innovative partnerships among education agencies, business and labour organizations and training councils are producing exemplary programs that can offer instructional models to the field. Workers are now being offered learning opportunities which relate directly to their jobs and integrate basic education skills with job skills. Third, individual employee assessment techniques are extremely diverse. Assessment of workers either before or after training vary in method and outcome. Some programs use standardized tests, others design their own while still others use informal feedback or administer self-assessment exercises.

In a review of key program principles the Business Council for Effective Literacy (1987) clearly stated that it is important to teach basic skills using the context of specific jobs. They suggest that teaching literacy strategies appropriate to workplace needs will enable employees to accomplish specific tasks, make judgements and solve problems. It is also recommended that the training curriculum be customized to suit the needs of the company and the specific jobs that must be done.

One effective way of doing this is using the materials that are actually found on the particular job site for instruction. This approach helps employees to understand what the job actually

consists of and what performance requirements really are. As trainers attempt to follow these key program principles, what is needed is a strategy that will provide vital information about how much and what kind of instruction is really necessary to improve performance. Literacy task analysis may be part of the answer.

Chapter 2

JOB, TASK ANALYSIS AND LITERACY

TASK ANALYSIS

The Historical Context

Job analysis and task analysis are terms which are in common usage in the domains of industrial psychology and human resource management. Seemingly simple terms, job analysis and task analysis are in fact complex, encompassing a great many purposes and designs. As is suggested by the terms, job analysis refers to analyzing the various properties of jobs, whereas task analysis refers to analyzing specific tasks within jobs. While the two terms are sometimes used interchangeably, it is wise to keep this basic distinction in mind. The purpose of this chapter is to highlight the definitions, purposes and methods of job and task analysis as a foundation for understanding the dimensions of a literacy task analysis.

In a recent discussion on its historical antecedents Primoff and Fine (1988) trace back job analysis to Socrates and his "just" state which recognized individual differences in aptitude for work and unique requirements of different occupations. Diderot, the eighteenth century Encyclopedist, is also credited with early applications of job analysis through his comprehensive description of trades outlined in his Encyclopedia.

However, job and task analysis is most often thought of as a late 19th and 20th century phenomenon, with early applications being tied to the scientific management techniques devised by Frederic W. Taylor in 1903. The scientific management approach linked the aims of the engineer and the psychologist, using time and motion studies to determine the optimum way of performing a job.

However, early job analysis is often linked to the two world wars, with the many technical requirements of jobs and the urgent need for these jobs to be well understood and well planned so that recruits could either be channeled into jobs for which they had the particular background or skills, or trained for those jobs.

In between the two world wars, a further use for job analysis was initiated linked to employment development. The U.S. ***Dictionary of Occupational Titles*** was an outgrowth of this phase, defining as closely as possible all the jobs in the American economy. In Canada this Dictionary of Occupational Titles was used until the mid-sixties when the ***Canadian Classification and Dictionary of Occupations*** was developed.

Definitions and Purposes of Job and Task Analysis

According to Ash (1988, p. 3) job analysis broadly defined is the collection and analysis of job-related information by any method for any purpose. This procedure attempts to reduce to words things that people do in work. Banks (1988) describes job analysis as a generic term referring, not to a single activity, but to a diverse range of procedures designed for a variety of objectives. In a similar vein Pearn and Kandola (1988) define job analysis as any systematic procedure for obtaining detailed and objective information about a job that will be performed or is currently being performed.

Job analysis can vary on several dimensions, for example the types of descriptors or elements used to describe jobs, the forms in which job information is obtained either quantitative or qualitative, the sources of job information, the methods of data collection and the level of analysis. Considering these dimensions and the fact that a single job analysis methodology can involve multiple aspects of each dimension, two things seem to be apparent:

1) **there are many ways to analyze jobs, and;**
2) **job analysis can be a somewhat complicated undertaking.**

The literature on job analysis also contains numerous uses for the information obtained such as job descriptions, personnel requirements and specifications, worker training, curriculum design, work mobility, efficiency, safety and workforce planning. In particular the identification of training and learning needs are well established applications of job analysis. Pearn and Kandola (1988) report that a study of key brewery operatives using analysis procedures revealed that the job was being taught in a very mechanistic way, whereby the operators were expected to memorize complex routes of fluids through pipes around the site. In the

past the job had taken a very long time to learn, mainly through trial and error. However results from the job analysis indicated that the operators needed not only to memorize this information but also to develop the skills of planning the most efficient routes and to learn from the experience of prioritizing and anticipating the flow of fluids (p. 6).

Task analysis, however, is defined as a systematic method of accounting for the interactions between one or more individuals and a system, together with the conditions that must be satisfied if the interactions are to occur effectively. (Van Cott and Paramore, 1988, p. 651). Once again the types of information included in the task analysis may vary considerably depending upon the purpose to which the data will be put.

The information obtained from a task analysis also has numerous applications. Some of the most important and frequently used applications are the identification of skills and knowledge needed to perform tasks which serve as the basis for the development or assessment of training courses, the design and evaluation of operational and maintenance procedures, and the development of safety requirements and evaluation of safety provisions.

To better understand the procedures for task analysis it is important to know the characteristics of a task. A task is a goal directed unit of work, for example, replacing a wheel bearing, operating a hand jigger, completing a driver's trip sheet. Tasks may involve the use of tools and equipment as well as the use of written procedures and other job aids. A task may be mental, physical or a combination of both and has the following characteristics:

* ***some set of conditions that require and initiate human performance***

* ***a specific purpose***

* ***a definite beginning and end***

* ***occurrence in a relatively short period of time***

* ***possible interruption by another task***

* ***the possible involvement of more than one person, as when one person initiates a task by another by giving a command (Van Cott and Paramore 1988, p. 653).***

A task can also be subdivided into smaller units called task steps, sub-tasks or behavioural elements and usually has the following characteristics:

* ***it is performed by a single person;***
* ***it can be written as a sentence;***
* ***it can be interspersed (in time) with elements of other tasks, and;***
* ***it is a necessary contribution but will not alone accomplish a functional objective.***

It is seldom sufficient to conduct a task analysis that simply identifies tasks by name alone. More often tasks are sub-divided into component elements to obtain the level of detail needed to perform a meaningful evaluation of such aspects of task performance as the required skills and knowledge.

Van Cott and Paramore (1988) maintain that there are also two generic types of tasks - discrete or procedural tasks and continuous or tracking tasks. A discrete task requires an individual to perform a series of separate action elements in response to specific stimuli or instruction given in a procedural

document. A continuous task requires an individual to operate continuously, for example, an All-Test Scan or to monitor continuously an automated system for quality control. These tasks may extend over a relatively long period of time with various discrete tasks time-shared with it.

Differences Between Job and Task

A job consists of all of the tasks performed by a given person, position or job category such as a mechanic, receiver or bakery clerk. In other words a job is a group of tasks that has been assigned to a single employee. Determining whether a job analysis or task analysis is most appropriate generally depends on the stage of development or change within an organization. In a company, business or firm that has been in operation for some time positions will exist and tasks will have been assigned to each position. At this point either a task analysis or a job analysis may be appropriate depending on the problem being examined. For example, a job analysis rather than a task analysis would be

needed if information were required to write job descriptions in order to establish wage and salary guidelines. On the other hand, if a company has introduced the use of robotics technology and is interested in retraining employees, a task analysis would be needed to determine the new tasks required to implement the change.

Approaches and Techniques in Job and Task Analysis

As previously mentioned there are numerous methods for collecting job information as well as different uses for the information obtained. Ash (1988, p. 4) describes these data collection methods under the following categories:

* ***observation (direct, critical incident diaries, work sampling)***
* ***interviews (individual, group, technical conferences with subject matter experts), and***
* ***questionnaires (structured and activity checklists, open-ended)***

Because of this wide choice of methods, it may be useful to discuss the various approaches and range of techniques involved in job and task analysis.

In order to help the analyst gather systematic data or information for a specific work problem, it is important to have a framework to guide the decision-making process. Pearn and Kandola (1988) suggest that one of the main challenges for analysts in performing a job and task analysis is to conduct it in such a way that it does not artificially distort the job or task being analyzed. There is a risk that when the job or task is broken down into specific sub-tasks or elements, the dynamic properties of the job or task are missed. By concentrating on the microscopic detail, the analyst could fail to see aspects of the overall picture which are critical to success.

In addition the authors suggest that there are several factors that make it difficult to obtain accurate and meaningful data. First, there is a risk that the analysis takes a snapshot picture which freezes the job or task at some point providing little insight into how the job has evolved or will change in the future. Second, the job or task takes on different properties depending on who happens to be doing it. This may have more to do with the context and climate in which the job is done and the perception of the job holder than with individual skills and abilities. Third,

there are situation determined changes. The job description of automotive mechanic in a small town garage may be identical to that of an automotive mechanic in a large urban car care company; however, both would be different in practice.

In a broader sense, the results of job and task analyses can contribute to improving the way in which human resources are managed. Most methods have been developed by focusing on the potential applications of job analysis information. Levine, Thomas and Sistrunk (1988) state that in the absence of theoretically determined ways of selecting a job analysis approach, the determination of the best method to use must rely primarily on the needs of the user organization. A job analysis is usually performed in order to facilitate one or more human resource management applications.

Application Specific. Research evidence suggests that job analysis methods are application-specific. Levine et al (1983) demonstrated that certain methods seem to be better suited and have more utility for certain application than for others. Stated simply, purpose and practicality must govern the choice of a job analysis method. With this in mind it is important to remember that

all methods involve different levels of analysis each with a large number of alternatives. Some of these levels of analysis include: duties, tasks, activities, elemental motions, job dimensions, worker trait requirements, scales applied to units of work and scales applied to worker trait requirements.

Because applications govern the choice of job analysis method it is therefore vital to match the human resource application with a specific job or task approach. For example if worker training was identified as a human resource application, then a Functional Job Analysis method may be most suitable. In the case of a workforce mobility application a Jobs Component Inventory method may be more appropriate, and if workforce planning was a considered application the Threshold Traits Analysis method may be useful.

In this investigation an attempt will be made to modify the techniques used in some of these methods and apply then in the context of a changing workplace where basic skills are prerequisites for effective job performance and worker satisfaction.

Examining the Whole Job. Another approach to job and task analyses is to view it as a process which examines the component parts of some whole. According to Carlisle (1987) this process entails several basic steps. First, the analyst breaks down the task by finding what the job is and then detailing how the job is done. A clearly communicated definition of the job results from a completed listing of task statements and involves analysis techniques such as the Interview Note Technique, the Card Sort Technique, the Job Function Technique, the Walk and Talk Technique and the Risk Assessment Technique. Once the analyst has discovered what tasks are significant and has listed them, it is important to describe how these tasks are done. This is called task detailing. Only the most critical tasks are analyzed for sequence, relationship and other details like needed tools, equipment and materials. From a task detailing it is possible to develop the job aids for training programs. Detailing how the job is done requires analysis techniques such as the Basic Task Description Technique and Flow Chart Technique.

Another step in analyzing a job is to determine how to acquire or learn the tasks, skills and knowledge associated with performance. Flow charts, decisions tables and other documents which come out of the actual analysis provide adequate information to learn the job with simple on-the-job training. The analysis itself can provide the final method for learning the job.

In Chapter 3 an attempt will be made to describe and explain the suitability of some of these various techniques when conducting a literacy task analysis. The format will include a case study approach detailing the methods and results of the literacy task analysis with different types of employees from various occupational sectors.

Literacy Task Analysis - A Definition

Literacy task analysis, the defining of the literacy elements required to do specific jobs, is a relatively new field which has sprung from the interest in literacy which has emerged from the Job Partnership Training Act (JPTA) and other legislated initiatives aimed at promoting greater efficiency by the American workforce.

Literacy task analysis is similar to traditional task analysis with one important difference. It describes a method for analyzing

the job tasks which require reading, writing, computation, communication, critical thinking, problem-solving skills, personal management and teamwork skills. From that analysis, training needs can be identified for persons already in the jobs, along with assessment procedures for entry level staffing.

In a literacy task analysis, the analyst performs the procedures from two viewpoints. One is the traditional viewpoint - examining the various tasks required to do a job. The other is examining the specific literacy skills required to carry out those same tasks. It involves a "double layer" approach in which the analyst is not only looking at the task and the skills required to do it, but is focusing on the literacy elements of each task. While on the surface, one could describe those literacy tasks as "reading, writing and computation", the tasks are actually much more complex as indicated in the ***Basic Skills Profile***.

The Purpose of a Literacy Task Analysis

As with job and task analysis, a literacy task analysis can serve several purposes - all intended to improve workplace training

programs. Some of these include: learning new tasks, transferability and promotability.

Learning new tasks. With technological change happening so quickly many employees are now required to learn new tasks such as operate highly technical equipment or master complex quality control procedures. By conducting a literacy task analysis, trainers can develop materials that integrate the basic skills with new job tasks. This will enable employees to respond to change more effectively.

Transferability. By identifying the literacy requirements of different types of jobs workers will better understand the added skills needed in order to move from a current position to another one in the company. A literacy task analysis can clearly point out the different types of basic skills and training required to improve an employee's ability to deliver quality service in lateral transfers within an organization.

Promotability. Employers often report that they have reliable workers who demonstrate desirable employability traits such as positive attitude, punctuality and sensitivity, but who lack the

basic skills required for higher level jobs. Conducting a literacy task analysis of these higher level jobs will enable trainers to develop materials that will better prepare these employees for promotion and increased responsibility.

Recently some unions have attempted to discourage employer designed literacy audits and have opted for the more participatory worker-involved job analysis (Sarmiento and Kay, 1990). To help clarify this situation, the authors of this report feel that it is important to mention here that a literacy task analysis is <u>not</u>:

* ***a study of the worker***
* ***a performance appraisal***
* ***a method for determining which workers should be assessed using standardized tests***
* ***a time and motion study***
* ***a standard for evaluating worker's job performance***
* ***a means for linking jobs to grade levels***
* ***a job evaluation***

Current Practices in Conducting a Literacy Task Analysis

As with job and task analysis, there are several ways of performing a literacy task analysis. Useful to the field of workplace literacy, Carnevale, Gainer and Meltzer (1988) have developed the components of a generic task analysis process for individual jobs or job families. Briefly the steps include:

1) ***select the job(s) to be analyzed***
2) ***develop a preliminary list of duties and tasks performed on the job(s) to be analyzed focusing on Basic Workplace Skills***
3) ***review, refine and revise the preliminary list of skills using expert committees***
4) ***verify the skills necessary for the job(s) with company employees***
5) ***perform a task detailing focusing on Basic Workplace Skills for each task selected for inclusion in the training program.***

The authors suggest that the result of this type of analysis lays the foundation for a good instructional program. It can provide instructors with information to develop lessons on those skills, knowledge and abilities employees need to perform a job successfully.

Similarly, Mikulecky (1985), Drew and Mikulecky (1988) and Askov (1989) have outlined the steps in conducting a literacy task analysis. The steps in this method, which were adapted from general job and task analysis procedures, include:

1) ***choosing and scheduling site visits***
2) ***interviewing professional staff and site tours***
3) ***selecting workers to interview and observe as they perform basic skills tasks***
4) ***gathering literacy materials, and,***
5) ***developing instructional materials which involves curriculum planning, documenting the results of the literacy task analysis, creating instructional simulations and tailoring simulations to worker's needs.***

Using a slightly different method Olson (1989) describes a literacy audit as a part of the larger system called workplace literacy assurance. Literacy assurance provides an employer with a record of each employee and each job. This systems approach involves two procedures - an occupational analysis and a task analysis. In a standard occupational analysis an occupation is broken down into worker tasks and the resulting tasks and duties

are verified by incumbent workers. In the second procedure each task is analyzed for literacy skills involving communications, computation and problem-solving. Also identified are the tools and equipment used on the job, appropriate attitudes and safety skills. These skills are placed in a matrix from which instructional design recommendations may be prepared.

Current practice in conducting various forms of literacy task analysis seems to suggest that by observing and interviewing workers and examining job-related printed materials instructors will be able to better understand the demands of the job, which allows them to teach the basic skills required for those jobs. Although an instructor must be familiar with a worker's job it is not the job task but the basic skills a worker needs in order to accomplish the job task that is to be taught. As Philippi (1988) notes the job materials merely serve as a vehicle for teaching, for example, the reading processes required on the job.

Drew and Mikulecky (1988) also suggest that in documenting the results of a literacy task analysis certain skill clusters most likely will surface. Some of these clusters include: locating information, writing summaries, troubleshooting, using multiple

sources of information, problem-solving and technical vocabulary. In a similar vein and as a guide for developing instructional strategies, Philippi (1988) suggests that learning objectives should be written for each job reading task. In addition, teachers should classify each reading process identified in the job materials as either a strategy for locating information or a strategy for using information.

Useful to the analyst is Philippi's compiled list of job specific reading processes and competencies commonly needed to perform job tasks. These include vocabulary, literal comprehension, locating information within a text, comparing and contrasting, recognizing cause and effect, predicting outcomes, using charts, diagrams and schematics and inferential comprehension (p. 663).

Exploring Different Approaches. As can be seen from the preceding discussion laudable attempts have been made to document and use the results of a literacy task analysis in order to improve instructional design. As indicated by previous researchers and practitioners the methods used for general job and task analysis can be applied to performing a literacy task analysis. Presently, the most common use of the literacy task analysis results are

instructional simulations and sample activities. As Askov (1989) states teachers can maximize instruction by tapping the job content knowledge of experienced workers and developing an occupational-focused curriculum which becomes the core of a workplace literacy program.

Given that job and task analyses have been a field of study and scientific inquiry in the domains of industrial psychology and human resource management it may be useful to further explore the applicability of the different approaches, methods and techniques discussed in this chapter in light of conducting a literacy task analysis. Diverse jobs, different level employees, varied work environments and workforce needs may favour a certain technique, method or analysis. Also of interest to this project are the various applications of the literacy task analysis results in improving curriculum design and developing training programs.

Chapter 3

RESULTS OF THE LITERACY TASK ANALYSIS

Selecting Occupational Sectors and Jobs for the Investigation

According to the Economic Council of Canada (1990) the service sector is now a vital component of the Canadian economy in terms of both its domestic and international dimensions. Over 70 percent of Canadian workers are employed in this sector. However little attention has been paid to the growth of the services and its impact on the nature of economic activity including the basic skills requirements needed to function in such an occupational environment.

The service sector includes a wide range of diverse industries and can be divided into three sub-sectors each with its own distinctive characteristics and employment patterns. The **dynamic** sub-sector includes four major industry divisions:

1) transportation, communication and utilities
2) wholesale trade

3) finance, insurance and real estate, and,

4) business services.

The **traditional** sub-sector consists of retail trade, accommodation and food and personal services while the third sub-sector - **non-market services** - includes education, health, social services and public administration (p. 2).

Over the last few years economists have traditionally distinguished between goods and services with the goods producing sector consisting of primary industries such as agriculture, fishing, forestry and mining while the secondary industries include manufacturing and construction. The service sector, then, represents the remainder of the economy. As reported by the Economic Council of Canada (1990) goods and services are now vital to one another. To say that the Canadian economy is either goods-based or service-based would be inaccurate. Moreover it is an economy in which both sectors are essential to one another in a complex and linked way. As each begin to take on features of the other, the traditional distinction between them becomes less relevant. In many ways goods and services seem to be converging.

In order to better understand this converging economy in terms of basic skills requirements, it was decided to choose jobs for the literacy task analysis that were from both the goods and services sectors. Jobs were selected within occupational clusters that were characterized by a progressive application of production technologies, inventory systems, marketing techniques and commercial innovations. These included a motor vehicle repairer, a grocery store receiver, an assistant grocery manager, a bakery clerk, a pre-cast repair and cleaning labourer, a cement finisher, a hog pusher, a butcher and a butcher supervisor. For each job the literacy task analysis was conducted for a slightly different purpose to illustrate its various applications such as to update skills, to train floor supervisors, to identify training needs for key personnel, and to facilitate job transferability and job promotability.

Using a Case Study Approach

In this chapter the reader will find the results of the literacy task analysis presented in five case studies. For each literacy task analysis conducted with an employee, information is

discussed under some of the following categories: *Background of the Workplace, Design of the Analysis, Data Collection, Interpretation of Results* and *Strategies for Developing Training Materials.*

Specifically, in the section ***Background of the Workplace*** a brief discussion highlights such information as size of company, union or organization, number of employees, type of service or product delivered, qualifications of employees and other historical facts that provides the backdrop for the literacy task analysis. The ***Design of the Analysis*** section gives an overview of the approach used in the literacy task analysis along with the rationale for selecting the different techniques and methods for the sector and type of employee. In the ***Data Collection*** part of the case study time frames, procedures and types of methods and techniques used are discussed. In addition, an evaluation statement is made as to the appropriateness of using these data collection and analysis methods with certain types of jobs. The ***Results of the Analysis*** section presents the findings from the completed literacy task analysis exercise. It summarizes the information gathered from the different methods and techniques and describes the job components in terms of the **Basic Skills Profile**. The final part of the case study identifies some of the key ways of using the results of a literacy task analysis to develop specific training programs and materials.

One of the prevailing themes in each of the case studies seems to indicate that by drawing from the vast knowledge base of job and task analysis, significant contributions can be made for improving literacy task analysis procedures. As the reader will observe, modifying approaches, techniques and methods from the larger domain provides both practical and specific results for improving job related basic skills training.

Case Study 1

Motor Vehicle Repairer - Automotive Repair Service Sector

WORKPLACE BACKGROUND

The Motor Vehicle Repairer who participated in this literacy task analysis is a licensed journeyman. He worked in a small car care business with six other employees and the owner, who is the president of the company. The business which was started in 1972 offers a complete automotive repair service in both electrical and mechanical and specializes in preventive maintenance. After a car has been serviced a history of the repairs is recorded and the customer receives a regular notice outlining the functions and car parts that will require attention in the future.

The company hires employees at the apprenticeship and licensed journeyman levels to work at the 15 bays. In this company, which is representative of the many smaller repair shops, working with the customer is considered to be a vital competency. All apprentices are working towards a journeyman certificate and the licensed technicians are involved in continuous upgrading courses

offered through the local Industrial Training Council and other professional training services. For a number of years, the owner of the company has provided community leadership in updating training programs for both apprentices and journeyman and has participated in previous occupational curriculum projects funded by the Ontario Ministry of Skills Development.

DESIGN OF ANALYSIS

The basic steps in performing the literacy task analysis included the following:

1) ***observation interview***
2) ***task matrix technique***
3) ***basic task description technique***
4) ***task criticality***
5) ***learning objective technique***.

The approach used in conducting the task analysis involved a process which broke down the whole job into component parts. The first step in the process was to find out what the actual job

entailed. This was done through the **observation interview**. Second, the analyst outlined the competencies required of the main job duties using the **task matrix technique**. This resulted in a definition of the job and task statements. Next, the **basic task description technique** was used to detail the tasks and analyze for sequence, relationship and other details. A brief **task criticality** exercise was then performed on the different task elements. The final step in analyzing the job was to suggest ways of learning the most critical tasks, skills and knowledge associated with performance of the targeted duties. This was done through the **learning objective technique**.

DATA COLLECTION

Initially the employer of the company was interviewed in order to identify the competent worker who would participate in the literacy task analysis case study. Questions used during this interview are found in Figure 2. The information obtained during this interview provided a good background of the work environment, main duties and competencies of the job as perceived by the employer and highlighted the critical areas to be discussed with the competent worker.

FIGURE 2

Employer Questions for Selection of Competent Worker

1. What is the job title of the selected employee? Actions performed? Objects used?

2. What are the main duties of the job?

3. Are there new systems, procedures or responsibilities on the job?

4. Are there difficulties experienced by present employees due to a deficiency in literacy-related skills?

5. Are there procedures not fully or correctly utilized?

6. Have there been accidents or legal liabilities due to a deficiency in literacy-related skills?

7. Does your company have a sufficient pool of qualified workers?

A week later the analyst interviewed the competent worker in the company office using a modified version of the employer interview form. During the 30 minute conversation, the motor vehicle repairer described the main duties of his job, the percentage of time spent working on those duties and the types of skills used to work effectively on the job. A preliminary attempt was also made to have the competent worker describe some of the basic workplace skills used in performing his main job duties. Also during this time, a tentative schedule for observing the targeted duties was arranged. It was decided that two types of main job duties would be useful to observe. In an average week, approximately 80 percent of the worker's time was spent in performing electronic tune-ups and repairing brake problems.

Within the next two weeks the competent worker was observed for three hours while working on an engine tune-up and for three hours while repairing a brake malfunction. The analyst used the **observation interview**, which entailed both observation and subsequent questioning in order to obtain further information on the tasks being carried out. This was done while the worker was performing his duties. During the observation, the analyst made special note of all of the specific basic workplace skills used by the competent worker. After eacn observation period, the analyst wrote up the observation notes which were used as a source of reference in the next step of the analysis.

The information gathered was then categorized using the **task matrix technique**. The technique helps arrange the observed actions or competencies of the competent worker in relation to the targeted duties. This data collection method resulted in a job description and the development of task statements which were both verified with the competent worker.

The next step in the analysis was to describe exactly how the two major duties were performed by breaking down the task statements. Sequence, relationship and other details of the tasks were analyzed using the **basic task description technique**. This method of collecting data is used to record the steps or elements in a task along with related information like specific workplace basic skills.

After each task statement was detailed, the competent worker rated the frequency importance and difficulty in learning each of the major tasks. This exercise called **task criticality** provided the focal points for using the **learning objective technique**, which is the key to developing a potential training program. This technique is used to define the skills and knowledge needed to perform tasks. As well it provides observable and measurable criteria for learning how to do a job task.

It should be noted that in this case study, the development of additional employee training was not one of the project goals. However, the **learning objective technique** was used here to simply illustrate the ease in which an analyst can use the result of a literacy task analysis towards the actual implementation of training.

RESULTS AND INTERPRETATION OF ANALYSIS

The information gathered through the **observation interview** enabled the analyst to use the **task matrix technique**. As indicated in Figure 3 four targeted duties were arranged in relation to competencies. In this case, competencies refer to the skills, abilities and knowledge required to succeed on the job. The seven competencies - assessing, diagnosing, estimating, communicating, planning, repairing and evaluating - were crucial to performing each of the major job duties. Since the analyst observed the performance of the first two duties, only those are "X"ed. From this data collection form, the following description of the job was developed.

Task Matrix - Motor Vehicle Mechanic

	Competencies						
Targeted Duties	Assess	Diagnose	Estimate	Communicate	Plan	Repair	Evaluate
Electronic Tune-Ups	X	X	X	X	X	X	X
Brakes	X	X	X	X	X	X	X
Steering							
Transmission							

MOTOR VEHICLE REPAIRER

The Motor Vehicle Repairer is a licensed journeyman who is able to repair both electrical and mechanical car problems. The individual is responsible for assessing, diagnosing and estimating costs for problems associated with electronic tune-ups, brakes, steering and transmissions. He is able to communicate with customers, plan the operations required for each job and to repair the malfunction in a proper order so that work can be evaluated according to written specifications.

From the completed task matrix, task statements were written. To illustrate this exercise, task statements were developed for the main duties of electronic tune-ups and brakes. These statements are presented in Figure 4. Both the task statements and the job description were verified with the competent worker before detailing the task steps.

FIGURE 4

Task Statements

1.0	ELECTRONIC TUNE-UP	
	1.1	Assess engine malfunction
	1.2	Diagnose engine problem
	1.3	Estimate costs
	1.4	(a) Communicate problem to customer
	1.4	(b) Communicate costs to customer
	1.5	Plan operations
	1.6	Repair engine malfunction
	1.7	Evaluate repair
2.0	BRAKES	
	2.1	Assess brakes problem
	2.2	Diagnose brakes problem
	2.3	Estimate costs
	2.4	(a) Communicate problem to customer
	2.4	(b) Communicate costs to customer
	2.5	Plan operations
	2.6	Repair brakes malfunction
	2.7	Evaluate repair

In using the **basic task description technique**, each task statement for the targeted duty was broken down into smaller units called task elements and specifically analyzed for the basic workplace skills and knowledge requirements. For example, the task ***"assess engine malfunction"*** was further detailed into:

a) read job order and,

b) test drive car.

In terms of skill analysis, reading the job order form required the competent worker to know and comprehend the vocabulary used to describe the malfunction. This type of detailing and analysis was performed for each of the task statements of the targeted duty electronic tune-up only. The results are presented in the following chart.

JOB: MOTOR VEHICLE REPAIRER

Targeted Duty: 1.0 Electronic Tune-up

Task: 1.1 Assess Engine Malfunction		
Task Element	Workplace Basic Skills & Knowledge	
1.1 (a) Read job order	*	know and comprehend vocabulary used to describe malfunction on job order form
1.1 (b) Test drive car	*	listen and note possible malfunctions listed if not listed on job order

Task: 1.2 Diagnose Engine Malfunction

Task Element			Workplace Basic Skills & Knowledge	
1.2	(a)	Perform an ALLTEST	*	connect appropriate probes to engine parts
1.2	(b)	Read results from scope sheet	*	know and understand codes and numerical values
1.2	(c)	Check spark plugs, distributor cap, wires, air filter, fan belt	*	decide which part to check first
			*	verify results from scope sheet by checking designated parts

Task: 1.3 Estimate Costs

Task Element			Workplace Basic Skills & Knowledge	
1.3	(a)	Locate parts and price from catalogue	*	refer to appropriate catalogues and sections, locate information and prices and write information on job order
1.3	(b)	Estimate parts and labour costs	*	calculate estimation

Task: 1.4 Communicate with Customer

Task Element			Workplace Basic Skills & Knowledge	
1.4	(a)	Call customer	*	use effective telephone skills
1.4	(b)	Explain mechanical problem	*	translate mechanical problem into "layman's language"
1.4	(c)	Answer customer questions as to why and how the problem occurred	*	ask probing questions to ensure customer's understanding
1.4	(d)	Give estimation and obtain approval to do repair	*	speak clearly

Task: 1.5 Plan Operations

Task Element			Workplace Basic Skills & Knowledge	
1.5	(a)	Sequence repair activities mentally	*	establish priority for conducting repair
			*	decide most effective way for completing repair
1.5	(b)	Estimate time for each activity	*	allocate a given amount of time to perform each activity
1.5	(c)	Order parts from distributor	*	give accurate information
1.5	(d)	Select proper tools	*	decide on which tools to use

Task: 1.6 Repair Malfunction		
Task Element		**Workplace Basic Skills & Knowledge**
1.6 (a) Refer to specifications	*	locate specifications guide on hood or in Chilton Repair Manual
1.6 (b) Perform operations in proper order	*	follow repair plan
	*	check for care of equipment
	*	check for workplace hazards
1.6 (c) Complete repair	*	evaluate time schedule
	*	track results after each activity
	*	communicate activity level and progress with other employees

Task: 1.7 Evaluate Repair		
Task Element		**Workplace Basic Skills & Knowledge**
1.7 (a) Test drive car	*	listen and note how corrected repair functions
	*	show information on job order form

As can be seen from the results of the literacy task analysis specific competencies from each of the five major skill categories were required to perform the targeted duty of engine tune-up. Once again the Basic Skills categories included: *literacy and numeracy skills, listening and communication skills, creative thinking and problem-solving skills, personal management skills and teamwork skills.* In the next step of the analysis the competent worker was requested to rate the frequency, importance and difficulty in learning each of the major tasks. This exercise was called **task criticality**. The rating scale values for each question ranged from 1 (very frequent) to 7 (most frequent) respectively. Results from this exercise indicated that:

a) all tasks were most frequently required,

b) all tasks were critical, and,

c) two tasks were most difficult to learn.

Those tasks were diagnosing the engine malfunction and communicating with the customer. Since both of these tasks were also rated as most frequently required and critical to performance, they could become the key areas for engine tune-up training

development. In addition the completed workplace basic skills analysis can provide other target areas for training depending on the needs, circumstances and available funds of the company.

In applying the **learning objective technique** to the "difficult to learn" tasks, the analyst uses the results of the analysis to write measurable learning objectives. For example let's take the task of **"Communicating with Customer"**. The analyst along with the competent worker and employer uses the five specific skills to develop performance objectives. Again, the five specific workplace basic skills and knowledge included:

* ***use effective telephone skills***
* ***translate mechanical problem into "layman's language"***
* ***ask probing questions to ensure customer's understanding***
* ***speak clearly***
* ***ask questions directly***.

This process entails writing terminal objectives, enabling objectives and entry behaviours for the different competencies. The information is crucial for specifying and testing performance

in the designated training areas. Once the objectives have been written the actual materials used in performing the task can be used to further develop the job-specific training curriculum. Examples of how to write these types of objectives are illustrated in the Manual.

Case Study 2

Grocery Store Receiver - Retail Sector

BACKGROUND AND DESIGN OF ANALYSIS

The Receiver in a grocery store, as the title indicates, is responsible for receiving virtually every article for the store. This is a key job, for without the receiver, stores would have empty shelves or a chaos of boxes in the back room. A literacy task analysis was performed on this job using the interview note technique and observation, with additional elements from the job function and risk assessment techniques. A brief description of these tools are presented here to assist the reader in understanding how they are actually applied when conducting the literacy task analysis.

The Interview Note Technique

The **Interview Note Technique** is one of the most common approaches to job and task analysis. It is, essentially, an interview with the competent worker, during which the analyst

records tasks and sub-tasks, with particular attention to those which are central to the job's purpose. This technique is useful in establishing what tasks are significant, but it can in no way stand alone as task analysis owning to it limitations. Its major limitation is that, if not married to actual observation of the competent worker, it tends to be very subjective.

The Job Function Technique

The **Job Function Technique** identifies job functions, and categorizes them as they relate to information, people and things. An information function, for example, could involve compiling or analyzing reports. A people function could be supervising or assigning duties, while a things function could be operating a machine. A strength of this method is that it requires the competent worker to think of the job as it pertains to very specific areas. This could be important if a reason for the analysis was to determine the balance between technical and machine functions and people oriented functions. However, if this particular breakdown was not considered relevant, this technique has no advantage over others.

The Risk Assessment Technique

The **Risk Assessment Technique** is used after the task statements have been itemized using one of the above methods (or others not outlined here). The importance and difficulty of each task is graded on a scale of 1 to 5. This technique assists the analyst to focus the training design on the most important tasks. A failing, however, is the subjectivity of the scale ratings.

The techniques identified above permit the analyst to obtain a description of the targeted position based on an interface between the competent worker and one of the methods outlined. But, the truest technique of all is job observation. Job observation has the advantage of allowing the analyst to actually see the elements of the job rather than learning of them second hand through interviews or collection of materials. It is, however, very time consuming, and needs to be conducted in such a way as to minimize disruption of the employee's work.

DATA COLLECTION

You will recall that the interview note technique is essentially an interview with the competent worker, during which

the analyst records tasks and sub-tasks, with particular attention to those which are central to the job's purpose. This technique was married to actual observation to remove the subjectivity of the competent worker's comments and to ensure that no major elements had been missed. Four major functions were identified from the interview notes and the observation, each with a number of tasks. These are presented in Figure 5.

FIGURE 5

RECEIVER - GROCERY STORE

Major Task Elements and Sub-Tasks

1.0	RECEIVE MERCHANDISE	
	1.1	Open doors for reception of goods and greet driver
	1.2	Verify what shipment is being received
	1.3	Direct driver to location for off-loading merchandise
	1.4	Count cases and boxes on skids to verify quantity received
	1.5	Make inquiries to clarify discrepancies between expected order and order received
	1.6	Sign invoice for quantities received
	1.7	Place invoice in collector bin for accounts
	1.8	Farewell to driver and close doors

2.0	ARRANGE FOR RETURNS AND STORE TRANSFERS
2.1	Identify problems calling for transfer of merchandise from store. For example, time dated products, over-ordered or slow selling specials and defective materials received.
2.2	Phone Toronto to obtain work order number
2.3	Indicate quantities and what was sent back on work order
2.4	Call driver for pick up of "to be returned" articles
2.5	Sign work order form indicating credit to be received
2.6	Put form in bin for collection by accounts

3.0	ENSURE MOVEMENT OF MERCHANDISE
3.1	Load soft drinks onto trolley and place on shelf on store floor
3.2	If other merchandise not moving out fast enough through clerks, bring to attention of Grocery Manager
3.3	Arrange for pick up of soft drink empties

4.0	KEEP RECEIVING AREA CLEAN AND WELL ORGANIZED
4.1	Place boxes left by night crew in compactor each morning
4.2	Compact boxes
4.3	Tie compacted boxes ready for pick up by receiver
4.4	Place boxes in compactor after each order has been unloaded during the day
4.5	Ensure that materials are unloaded in appropriate spots so that major work area is clear of clutter
4.6	Wash floor at least once a day
4.7	Ensure that store employees dump unloaded boxes in designated places

If one took a narrow view to literacy task analysis, one would work with invoice forms, limited calculations of basic mathematics, and how to fill out work orders. If one takes a broader view of literacy task analysis, however, the skills which could be viewed under the headings of *Basic Listening and Oral Communication, Creative Thinking and Problem-Solving, Personal Management, and Teamwork* are also appropriate to use in building literacy training materials. As a matter of fact, since the job of receiver is fairly light on the reading, writing and computation side, these

other skill areas become important in building an effective training curriculum which will be relevant to the employee as the receiver and will also be relevant to him if he is trying to improve his reading, writing and computation skills in order to be considered for another job within the store or elsewhere within the food industry.

Another technique used in the literacy task analysis for the Receiver was the **Job Function Technique**. As previously described it provides standardized categories which can be used to identify and organize specific tasks. These categories are **INFORMATION FUNCTIONS, PEOPLE FUNCTIONS** and **THINGS FUNCTIONS**. Using this technique the analyst can apply these categories to the job functions which have been identified through interview and observation. **Information functions** include: comparing, copying, computing, compiling, analyzing, innovating, coordinating, and synthesizing. **People functions** include: instruction taking, helping, serving, exchanging information, coaching, persuading, diverting, consulting, instructing, treating, supervising, negotiating, and mentoring. **Thing functions** include: handling, feeding, offbearing, tending, manipulating, operating-controlling, driving-controlling, precision working and setting up.

The functions listed are by no means exhaustive, and one could add functions to the three categories. Applying this process to a particular job can lead to some useful insights. For instance, it would be easy to conclude that the job of the Grocery Store Receiver is basically a "things" job. After all, on the surface it appears to be a job where the main interface of the worker is with merchandise. The employee works out of the loading docks and reception area, and basically runs a one person show. He has neither staff nor adjacent co-workers. Yet when one looks at the sub-tasks of the major task element, it becomes clear that his interface with any number of delivery truck drivers is critical to the successful operation of this major task. Indeed, 5 of the 8 sub-elements of the task "**receive merchandise**" involve liaison with deliverers. The people function is perhaps **THE** central facet of the job. The people functions of exchanging information, helping, and negotiating become every bit as important as the things function of handling and manipulating.

After the interview and once the task elements have been identified and written up, one can go back to the competent worker and ask him to rate the task statements according to level of difficulty and importance. (Risk Assessment Technique). This will

be easier for a competent worker to identify if the job has many dimensions than if the job has few major task elements. This information can be important to the analyst in determining areas of concentration for the preparation of training materials.

INTERPRETATION OF RESULTS WITH FOCUS ON BASIC WORKPLACE SKILLS

This information provides a number of interesting elements for the analyst. One can conclude, for instance that:

a) ***there is a very limited amount of reading, writing and computation (the traditional literacy skills) required to do this function and,***

b) ***there is, on the other hand, a fairly high degree of interpersonal contact going on. The rapport which the receiver establishes with any number of drivers of delivery trucks (possibly 20 or more drivers a week) is crucial to the success of the job.***

This finding has implications when designing training materials for a receiver based on literacy task analysis, since simulations could be developed for both situations.

If one reviews the main functions of the Receiver position, one can identify some tasks with traditional literacy elements, such as writing up work orders for merchandise which must be returned, and, tasks calling for other skills such as time and space management, and effective interpersonal relations both with outsiders and insiders such as drivers and clerks in the store who are vital in getting the merchandise out on the floor under the receiver's direction.

USING FINDINGS FROM LITERACY TASK ANALYSIS TO DEVISE TRAINING MATERIALS

Literacy task analysis can provide a useful aid in the preparation of training materials for job incumbents and for prospective entrants to the job. In the case of the receiver, for instance, training materials could be devised which build writing skills simultaneously with problem-solving skills. The following example shows how this would work in practice.

An exercise could be devised in which the trainee is faced with a number of decisions on how to order his work. He could be given choices, and asked (both orally and in writing) to justify those choices.

For instance, the day receiver will:

* receive load from bread truck which is waiting
* package paper boxes from night shift
* move coke cases out onto the floor
* clean floor
* obtain work order to return over-ordered specials (by phoning Toronto)

The ordering will reflect a logic. For instance, the receiver will not receive new loads until he has first put old boxes into crusher and tied them neatly for collection. He will receive the bread truck order only after he has made room by ridding the area of voluminous cartons. Next, logically, he will obtain a work order to return over-ordered specials, since it is important to move these items out of the store as quickly as possible, and he will have the work order number ready at hand when the supplier comes for pick up. Next, he will move coke cases out on the floor - once again, clearing space, but doing this only after the more urgent items have been attended to. And, finally, he will clean the floor (a necessary task but one that can wait until more urgent tasks have been attended to).

The employee, in working his way through these priorities, can be asked to justify his choices in writing. When he does so the trainer will be able to assess two aspects:

1) ***the logic of the employee's problem-solving and,***
2) ***the strength of the employee's writing skills.***

If a spelling problem is evident, for example, it may help to review job specific vocabulary and various rules of word formation. If sentence fragments are abundant, it could help to review the parts of a sentence and how to identify them. Whatever writing problems the employee has will probably emerge as the employee works his way through the problem-solving exercises.

In addition, problem-solving/prioritizing exercises can help build oral skills and teamwork if workers are asked to discuss their approaches to problems and reach a consensus on action. The trainer will perform the role of facilitator. Many workers will not have had the experience of organizing thoughts orally and communicating them to co-workers. Exercises on cause and effect, on seeing relationships between seemingly unconnected pieces of information and on drawing conclusions will all be helpful in

making the worker a more skilled communicator and a more effective team player. These exercises will grow out of the knowledge of the job gleaned through literacy task analysis.

LESSONS LEARNT FROM THE LITERACY TASK ANALYSIS

The Factor of "Prior Knowledge"

There is one major complication to task analysis. When you conduct a task analysis, it is difficult to assess prior knowledge of the employee. For instance, if you were observing a plumber, and saw him or her carrying out various functions, it may not occur to you that many of the decisions made in doing the job are based on prior learning. Knowledge of measurement and pressure may be an essential part of a plumber's trade, yet an analyst observing this work may never be able to assess just know much that knowledge determined the various choices made when making decisions about tasks.

This problem is particularly acute when one conducts a LITERACY task analysis for entry level employees, many of whom have low basic skills. The entry level employee may have more difficult

reading tasks to do than a more seasoned employee. The experienced employee, for instance, will only need to glance at a chart or diagram to verify one piece of information, whereas an entry level employee will need to labouriously digest the complete document, and refer to it often as he moves through tasks.

When you observe a competent worker, who has long since mastered the intricacies of many procedures, it can give a false idea of reading, writing and computation requirements for a new employee aspiring to the position of the competent worker. The important thing to do is to keep in mind this aspect of task analysis, and be aware of the fact that observing the competent worker does not give you the complete information you need to design appropriate training materials for a new employee. It does, however, give you a considerable part of what you need.

Observing the Competent Worker

There are many benefits of observing the competent worker when conducting a literacy task analysis. First, observing a person who is considered extremely adept at a job will help to reveal the competencies required to do the job. If, on the other hand, you

observe a less proficient employee, you may miss some important elements of the job. In other words, you want to ensure that **ALL** elements of the job are identified. Second, the competent worker will generally be a good source of information about the job. If the individual is doing the job so proficiently, it makes sense to assume that he or she has done considerable thinking about the job and its various elements. Third, since the competent worker is generally well respected, analysis based on your interactions with this person will probably be respected too.

The Problem With Observing the Competent Worker

Because of the prior knowledge that has helped the competent worker to do the job so well, the individual may take short cuts - either mental or physical - in performing tasks. This may be a disadvantage to an analyst who is trying to identify all the job elements with a view to designing training materials. The competent worker, because the job has come to fit him or her like a glove, may not be able to distinguish easy elements of the job from more difficult elements. The "It's ALL easy!" syndrome may surface in your interview with the competent worker, even though it's evident on observation that skills of varying complexity are required to do the various tasks.

Despite these problems, interviewing and observing a competent worker is a useful approach in literacy task analysis. In order to give some perspective to the problem of assessing the role of "prior knowledge" which is not evident in the observation, it may be useful to look at the ***Threshold Traits Analysis System*** as described by Sidney Gael.

The ***Threshold Traits Analysis System*** makes a distinction between knowledge and skill. Knowledge represents a person's retrievable information, involves only the brain and the central nervous system and is acquired physically by study. Skill, on the other hand, represents a psychomotor activity, involving both body and brain and is acquired only by practice. The Threshold Traits Analysis System utilizes thirty-three co-efficients to describe the system. The co-efficients are divided into the five following categories: ***physical, mental, learned, motivational and social***. While all five categories are essential in performing a job in the optimum way, categories **TWO**, **THREE** and several elements of **FOUR** are the most relevant to literacy task analysis. Co-efficients for these three categories appear in Figure 6.

In literacy task analysis, categories **TWO**, **THREE** and parts of **FOUR** become vital aspects in the analysis. Taken together, they

FIGURE 6

**Threshold Traits Analysis System:
Co-Efficients Relevant to a
Literacy Task Analysis**

MENTAL

6. Perception
7. Concentration
8. Memory
9. Comprehension
10. Problem-Solving
11. Creativity

LEARNED

12. Numerical Computation
13. Oral Expression
14. Written Expression
15. Planning
16. Decision-Making
17. Craft Knowledge
18. Craft Skill

MOTIVATIONAL

19. Adaptability - Change
20. Adaptability - Repetition
21. Adaptability - Pressure
22. Adaptability - Isolation
23. Adaptability - Discomfort
24. Adaptability - Hazards
25. Adaptability - Dependability
26. Control - Perseverance
27. Control - Initiative
28. Control - Integrity
29. Control - Aspirations

present a broad rather than a narrow definition of literacy. It is important that the employer or union whose employee or member you are observing know that you are looking at these broad aspects of literacy rather than the more limited aspects of merely the mechanics of reading, writing and computation. Training materials that deal with mental functions such as Comprehension and Problem-Solving, and with the more sophisticated Learned Functions such as Planning and Decision-Making will be more useful in the workplace than those dealing with more limited aspects. Keeping these co-efficients in mind will assist you in conducting your literacy task analysis in the workplace.

Case Study 3

Pre-Cast Repair and Cleaning Labourer - Construction Sector

WORKPLACE BACKGROUND

The third example presented is the job of pre-cast repair and cleaning in the construction industry. This job is one of the more skilled jobs within the many jobs done by labourers. The pre-cast repair and cleaning function is becoming increasingly important in the construction industry because of the growing preference for pre-cast finishings on buildings instead of the more labour intensive and time-consuming brick or cut stone which were once the standard finishes. The use of pre-cast concrete with various aggregate design and colour features is especially popular in the industrial and commercial building sector.

A major element of pre-cast repair is to establish the correct mixture of water, cement and aggregate to obtain a repair that will blend with the surrounding unrepaired surface, while cleaning requires a good knowledge of the appropriate dilution levels of the chemicals used. Because of the increasing use of pre-cast, workers trained in this area are able to access jobs specifically devoted to this specialty. It is thus seen as a desirable job for a labourer - one which could lead to mobility within the labourer occupation and the avoidance of some of the less interesting and more unskilled jobs within the labourer category.

The analysts wish to thank Locals 183 and 506 of the Labourers' International Union of North America for their generous giving of time and information so that this part of the study could be completed.

DESIGN OF THE ANALYSIS

The **Job Learning Analysis Method** described in Pearn and Kandola (1988) was applied to the pre-cast repair and cleaning labourer job. This method describes jobs in terms of learning skills which contribute to the satisfactory performance of the job. A learning skill is defined as one that is used to increase other skills or knowledge. For example we can improve our ability to observe and ask relevant questions, assess our mistakes and memorize. The learning skills represent broad categories of job behaviour which need to be learnt. These skills include:

1. Physical skills, that is activities that require practice and repetition in order to get right, become fast enough, or minimize errors. They do not include activities which are simple procedures and can be performed easily from written or oral instructions.

2. Complex procedures, sequences of activity or procedures which are: (a) remembered, memorized, or (b) followed with the aid of written material or other aids.

3. Checking, assessing, discriminating, that is: non-verbal information which is received by jobholders through their senses (sight, sound, smell, taste, touch) and which is used to make judgements or take some other action, and which usually takes practice to get right.

4. Memorizing facts, information, that is: (a) information that has to be retained in one's head and recalled for brief periods of time, or (b) information that has to be learnt, retained and recalled for a period greater than one day.

5. Ordering, prioritizing, planning, that is: the extent to which the jobholder has any responsibility for, and flexibility in, determining the way a particular job activity is performed.

6. Looking ahead, anticipating, that is: the jobholder can foresee problems and take some action which might prevent or at least reduce the effects of a problem or fault as well as meeting needs in advance.

7. Diagnosing, analyzing, solving, that is: the extent to which the jobholder sorts out problems (a) without assistance, or (b) with assistance such as manuals, other people.

8. Interpreting or using written, pictorial, diagrammatic material, that is: the extent to which written materials, manuals and other sources of information (diagrams, charts) need to be used and or consulted in order to learn the job.

9. Adapting to new ideas, systems, that is: the extent to which the jobholder is required to adapt to or learn new ideas, equipment, methods by using manuals or other written materials, or using other sources of information. (Pearn and Kandola, 1988, pp. 45-46).

DATA COLLECTION

The analyst performed a three step process in applying the Job Learning Analysis Method. First, the analyst met with the trades instructor who was teaching the pre-cast repair and cleaning course to a class of twelve labourers. These labourers varied in experience and ethnic background, with most of them being Canadian

born. On average, workers in this course had from three to five years of experience in the construction field. While the class was on coffee break, the instructor reviewed the course content with the analyst, with particular attention to the kinds of reading and writing requirements the workers would encounter on the course. Student workbooks were examined to establish the degree of ability to take notes on content presented. While significant spelling difficulties came to light, every student was able to note take to some extent.

Second, the analyst observed the workers doing practical work on pre-cast repair. Various difficulties which the workers might experience in carrying out an effective repair were discussed. This observation took about one half hour. Third, after lunch, the analyst utilized the **Job Learning Analysis Scoring Grid** to obtain a snapshot of the main tasks of the pre-cast repair and cleaning job, and how they rated in regard to the nine skill areas identified in this method. The Scoring Grid appears in Figure 7.

As a result of this exercise seven main activity dimensions for this job were recorded. These included:

1. ***Identify defect in pre-cast concrete.***
2. ***Mix proper mixtures and combinations of mixtures to effect repairs, and apply them.***

MAIN ACTIVITY No.	Description	LEARNING CATEGORIES: TIME SPENT ON ACTIVITY	PHYSICAL SKILLS	COMPLEX PROCEDURES	CHECKING/ASSESSING/ DISCRIMINATING	MEMORIZING FACTS/ INFORMATION	ORDERING/PRIORITISING PLANNING	LOOKING AHEAD/ ANTICIPATING	DIAGNOSING/ANALYSING SOLVING	INTERPRETING/LEARNING WRITTEN/PICTORIAL/ DIAGRAMMATIC MATERIAL	ADAPTING TO NEW EQUIPMENT/SYSTEMS
1.			1	2	3	4	5	6	7	8	9
2.			1	2	3	4	5	6	7	8	9
3.			1	2	3	4	5	6	7	8	9
4.			1	2	3	4	5	6	7	8	9
5.			1	2	3	4	5	6	7	8	9
6.			1	2	3	4	5	6	7	8	9
7.			1	2	3	4	5	6	7	8	9
8.			1	2	3	4	5	6	7	8	9
9.			1	2	3	4	5	6	7	8	9
10.			1	2	3	4	5	6	7	8	9

Figure 7 *The Job-Learning Analysis Scoring Grid*

Source: Pearn, M. and Kandola, R. (1988). Job Analysis - A pratical Guide for Managers. Institute of Personal Management. Wimbledon, London. p.49.

3. ***Measure joins between sections of pre-cast.***

4. ***Set up swing stage to specified length as required in order to perform tasks.***

5. ***Utilize correct safety procedures in regard to all work carried out.***

6. ***Identify areas where pre-cast cleaning is required and apply necessary amounts of cleaner which consist of muriatic acid and deox.***

7. ***Use extension ladders properly.***

Activity Analysis

Once the principal activities were recorded, each main job task was analyzed in more depth. A description of the activity analysis follows.

1. IDENTIFY DEFECTS

The identification of defects is a central aspect of this worker's job. On average, this function would take 15% of the worker's time. Checking for defects is done visually. The worker has full responsibility in this aspect of the work, and does not have to verify with a supervisor whether the defect identified is serious enough to require remediation.

2. GETTING THE PROPER MIX

The most creative and important part of this worker's job is to establish the correct mixture of water, cement and aggregate to obtain a repair that is not noticeable. This means that the worker will need to assess a number of variables such as: temperature at time of repair, as contrasted to time of original pour, percentage of coloured aggregate to main colour and thickness of surface to be repaired. Most procedures are routine. Written aids regarding number of cups to use, for instance at the beginning and are quickly committed to memory. Memorizing information is necessary on the job, but facts to be memorized are not complex.

Looking ahead to anticipate problems is key to successful performance of this aspect of the job. Judgements must be made as to whether the mixture is correct, and problems are overcome by determining how to avoid a defective mix. This may be done by adding more of a substance. Diagrams, charts or manuals are consulted only infrequently in order to learn the job, and there is no scope for having to adapt to new ideas, since job procedures are well established with few changes over time. This function is practice intensive, with considerable improvement being achieved from continued exposure to different situations, each calling for different mixes.

3. MEASURING JOINTS BETWEEN SECTIONS OF PRE-CAST

What is generally required here is accurate use of the ruler, so that pre-cast slabs are accurately spaced and may be joined at 3/4" intervals. This worker seldom needs to read blueprints.

4. SETTING UP SWING STAGE

Setting up and using the swing stage is an important aspect of this job. On the six week training course, four hours each week is

dedicated to the subject of swing stage. Setting up the swing stage is a physical skill. It has a complex set of procedures with well defined steps. These procedures relate to matters such as: how and where to tie safety lines, use of safety belts, power swing stages versus manual swing stages, understanding weight and balances and setting up of counterweights and outriggers.

This function calls for more reading than most of the other functions. The worker is expected to read the swing stage manual - a book dealing with complex procedures. According to the course instructor, approximately 75% of trainees would be able to read this manual. Memorization of information is essential to the successful set up and use of the swing stage, and the worker has full responsibility and flexibility in determining how the function is to be carried out. This task is done without supervision. Problems with set up and use are sorted out with the assistance of manuals or experienced worker advice. Charts and diagrams are used rarely.

5. KNOWING SAFETY PROCEDURES

Knowledge of safety procedures is obtained through a combination of remembering pertinent facts outlined by the instructor, and referring to written safety documents such as

general WHMIS and trades specific safety materials relating to chemicals used in pre-cast cleaning and safe use of equipment.

6. CLEANING PRE-CAST CONCRETE

This is one of the main tasks of the trade, taking up 30% of the worker's time on average. A physical skill, cleaning pre-cast also relies heavily on foreseeing problems and taking corrective action. For instance, diluting the chemicals 5 to 1 may not be as effective as diluting 10 to 1. Dilution levels will depend on variables, including precipitation, temperature and time of year, both at the time of cleaning and the time of original casting. No manuals exist on procedures for cleaning.

7. USING EXTENSION LADDERS

This is a physical skill, combined with memorizing some key facts of ladder safety. Written materials on ladder safety make extensive use of diagrams and pictures.

Based on this detailed activity analysis it would appear that these seven principal job tasks fall under two main categories. Job tasks 1, 2, 3, 4 and 6 relate to hand-on elements and job tasks 5 and 7 have background and knowledge dimensions.

Detailed Analysis by Learning Category

The final step in the application of the **Job Learning Analysis** method is to record the results of the main activity description across the nine learning categories in a matrix format as indicated in Figure 8. This exercise will show whether a particular type of learning applies to a specific job task. For example in the pre-cast repair and cleaning job the most frequent score obtained occurred in Category number 6 - "Ordering, prioritizing, planning, that is, the extent to which the jobholder has any responsibility for, and flexibility in, determining the way a particular job activity is performed". That is to say, six of the seven major work activities relate to this category of learning skills. Frequent scores were also obtained in Category number 4 - memorizing facts and information (5 out of 7 activities), and physical skills (4 out of 7). Conversely, low scores were indicated for Category number 9, adapting to new ideas, 0 out of 7,

Pre-Cast Repair and Cleaning Labourer

MAIN ACTIVITY No.	Description	TIME SPENT ON ACTIVITY	PHYSICAL SKILLS	COMPLEX PROCEDURES	CHECKING/ASSESSING/ DISCRIMINATING	MEMORIZING FACTS/ INFORMATION	ORDERING/PRIORITIZING PLANNING	LOOKING AHEAD/ ANTICIPATING	DIAGNOSING/ANALYSING SOLVING	INTERPRETING/USING WRITTEN/PICTORIAL/ DIAGRAMMATIC MATERIAL	ADAPTING TO NEW IDEAS/SYSTEMS
1.	Identify Defects	15%	1	2	(3)	4	(5)	6	7	8	9
2.	Mix and Repair	50%	(1)	(2)	(3)	(4)	(5)	(6)	7	8	9
3.	Measure Joins	MIN.*	1	2	(3)	4	5	6	7	8	9
4.	Set Up Swing Stage	MIN.	(1)	(2)	3	(4)	(5)	6	(7)	8	9
5.	Apply Safety Procedures	MIN.	1	2	3	(4)	(5)	6	(7)	8	9
6.	Clean Pre-Cast Concrete	30%	(1)	(2)	3	(4)	(5)	(6)	7	8	9
7.	Use Extension Ladders	MIN.	(1)	2	3	(4)	(5)	6	(7)	(8)	9
8.			1	2	3	4	5	6	7	8	9
9.			1	2	3	4	5	6	7	8	9
10.			1	2	3	4	5	6	7	8	9

Figure 8 *The Job-Learning Analysis Scoring Grid*

Source: Pearn, M. and Kandola, R. (1988). Job Analysis - A pratical Guide for Managers. Institute of Personal Management. Wimbledon, London. p.49

* MINIMAL

and for the categories relating to checking, assessing, discriminating; looking ahead and anticipating; and interpreting diagrams. We thus have a portrait of the pre-cast repair and cleaning worker. We are able to establish a number of facts from the analysis carried out through the Job Learning Analysis method.

INTERPRETATION OF RESULTS WITH FOCUS ON BASIC WORKPLACE SKILLS

We know, for instance, that the pre-cast repair and cleaning labourer works in an environment where he or she is expected to make independent judgements rather than being always told what to do. We know that physical skills are also important, and that a fair amount of memorization takes place in regard to knowing appropriate mixes of cement, aggregate and water, and accurate amounts of muriatic acid and such for cleaning pre-cast slabs.

We know as well that this is a job where there is no significant change taking place, so the worker is not expected to learn new methods or adapt to new ideas on a frequent basis. Nor is the individual called upon to interpret diagrams or charts on a regular basis. This kind of information can be useful to a trainer, since training strategies may be devised which will seek

to reinforce the types of learning skills that a particular kind of worker needs. This kind of information is particularly important to a literacy practitioner who is seeking to integrate literacy elements into training.

The literacy practitioner will be examining how to build problem-solving skills and creative thinking while at the same time building reading and writing skills. If he or she knows, for instance, that a worker will be required to master various complexities of safety using a swing stage the trainer will examine ways of helping the worker to better comprehension of the swing stage manual. This could involve some of the following components:

1. practice items on how to follow steps by step directions

2. memorization techniques

3. how to find what you need in the manual; for example, how to use table of contents, scanning techniques; how to find key ideas, clues for better understanding of work-specific vocabulary, understanding the purpose of various types of reading such as reading to explain "how to", reading to give background information, differentiating between points which will be required frequently in the future and those that need to be read once only.

The trainer, in working with the above components, will be achieving a double purpose. First, the worker will be learning more details about the swing stage and second, the worker will be learning how to use written material such as manuals, and how to apply certain kinds of reasoning. This will be transferable knowledge.

Comparing Two Jobs

The **Job Learning Analysis Technique** was then applied to the job of Cement Finisher. The technique had been applied earlier to the job of Pre-Cast Repair and Cleaning Labourer. That analysis had provided a profile of the learning skills which contribute to the satisfactory performance of that job. The purpose of using the technique on the job of the cement finisher is to compare the learning skills required to do these two jobs. The comparison will yield important information on how skill requirements for the two jobs differ. Then trainers can use this information to build training materials which will emphasize the new skill requirements. For instance, if one job was intensive on memorizing facts and information and the other job was not, then workers going to the job where memorization was important could benefit from some

training that help to master this skill. In fact, there is every reason to believe that many workers will be moving from cement finisher to pre-cast labourer or vice versa to respond to fluctuations in the labour demand or to respond to the desire for variety in work experience. Both these jobs are considered desirable and at the upper skill levels of the labourer designation.

The following description of the cement finisher job, along with a Job Learning Analysis Scoring Grid (see page 146) completed by the cement finishing course instructor, will allow us to make the comparison between these two jobs which is necessary in order to establish targeted training.

THE CEMENT FINISHER

The cement finisher, according to the Canadian Classification and Dictionary of Occupations (1977) smooths and finishes exposed surfaces of freshly poured concrete roads, sidewalks, curbs, floors, stairs, ramps and other concrete structures. Seventeen tasks are listed in the duties (of which 5 major aspects were highlighted by the instructor in preparing the grid). It is clear when reviewing the tasks that a variety of skills are required,

ranging from physical skills (spreading concrete, operating trowelling machine) to mental skills (using ruler, square, level and plumb line). In addition "people" skills are required to direct and assist workers covering freshly poured concrete with curing agents (burlap) or adding colouring powder or stone chips.

Local 506 of the Labourers' International Union of North America offers an 8 week course to labourers wishing to learn this job. Generally there are ten to twelve trainees on the course at any one time. The eight week course includes raw recruits as well as labourers wishing to diversify opportunities. At the present time the job is not an apprenticeable trade but efforts are being made to add it.

A major aspect of the cement finisher job is the responsibility. This worker must work alone and be expected to know what to do without supervision.

1. IDENTIFICATION OF TOOLS FOR A PARTICULAR JOB

A wide variety of tools are used to do this job and he must understand how to use each of them. These include: straight-edge,

trowels, wood floats, magnesium floats, bullfloat, and darby. He must also plan ahead by bringing appropriate protection for the particular job - rubber boots, gloves.

2. CHECKING THE SITE

The cement finisher checks the site to ensure that the concrete forms are accurate, working from plans and specifications, and using ruler, square, level and plumb line. He inspects job preparations and whether the job is protected from adverse weather conditions.

3. LEVELLING (PLACING) THE CONCRETE

This involves pushing or pulling screed over surface to spread concrete to specified depth. There is then a waiting period which must be respected. The timing is very important to achieving the desired results.

4. FINISHING THE CONCRETE SURFACE

The cement finisher must determine the mix for the finish and apply it. Does it need colour? hardener? silica? emery? iron? The cement finisher sprinkles these on in the required proportions. It will be necessary to add various items by the pound, so quantity measurement is needed.

5. SPRAY SEALER (CURING)

Sealer (muriatic acid) must be applied in the correct proportions with water, usually using a spray pump.

Looking at the Skills Categories

1. PHYSICAL SKILLS

Physical skills are used in placing, finishing and sealing (curing).

2. COMPLEX PROCEDURES

This category refers to sequences of activity or procedures which are remembered or memorized or followed with the aid of written material or other aids.

This category is most relevant at the site-check and at the point when the spray sealer is used. At the site-check stage, it will be necessary at times to review blueprints supplied by the superintendent before beginning the job and to remember the pertinent details throughout the job. In the case of the sealer, there are various possible sealants, and it is necessary to know whether the correct one is being used and what the various proportions are for various products.

3. CHECKING, ASSESSING, DISCRIMINATING

Visual checking is done of forms to see if they are level, and for assessing whether the ready-mixer has brought an appropriate amount of material.

4. MEMORIZING FACTS AND INFORMATION

This skill is most used at the stage when the worker is levelling or placing the concrete. It is necessary to recall the specific levels which have been set up by transit or by laser. When screeding and levelling are done, it is important to recall the elevation, since if it is an inch too high or an inch too low the job will be ruined.

5. ORDERING, PRIORITIZING, PLANNING

This is the key element of the job form beginning to end. Starting right from the requirement to bring the correct kind of boots and the right tools and proceeding through each item, planning is necessary, particularly since timing and planning go hand in hand. If timing is off, a job can be ruined at any stage of the job.

6. LOOKING AHEAD, ANTICIPATING (foreseeing problems)

While this is important at the preparation and site-check and at the levelling stage, it is especially important at the finishing

level. If a problem is not corrected before the substance is hard, it cannot be easily resolved without starting over.

7. DISCRIMINATING, PROBLEM-SOLVING

Problem-solving is done particularly at the finishing and curing stages.

8. INTERPRETING AND USING WRITTEN, PICTORIAL, DIAGRAMMATIC MATERIALS

This occurs at the curing stage. It is necessary to look at what is written on the bags in order to identify the various materials which could be used. Charts and written directions are used. The information will show how much colour must be added to the cement, for example, 1 part colour and 2 parts cement. Labels must be read on bags (colours) and pails (chemicals). The pails' labels will show how much water to add to muriatic acid when

applying sealer. WHMIS labels are also relevant in regard to these chemicals. Some of the substances are flammable and should not be near the propane heaters. Other products can be used near heat. This will be known by reading the product labels and the WHMIS material.

9. ADAPTING TO NEW IDEAS, SYSTEMS

This is particularly relevant at the finishing stage of the job. With changing technology, there are new materials and additives, each with its own unique properties. It is necessary for the worker to be adaptable and flexible in determining how the new products can best be used in relation to other products.

How to Use this Analysis

Now that we have a profile (snapshot) of two different jobs in the construction industry we can look at the similarities and differences in the learning categories for each job. This will help to identify skill areas which are different and which may

therefore be a subject for training emphasis. (It should be pointed out at the outset that just because a worker is not using a certain learning category to a great extent on a particular job does not mean that he is unable to do it; it does suggest, however, that this area of unfamiliarity could well be an area where trainers could help trainees to become more familiar with a new area of work competence.)

The comparison between the two jobs of pre-cast repair and cleaning labourer and cement finisher yields the following information.

1. Planning is extremely important for both jobs, obtaining the highest incidence on the Job Learning Analysis Scoring Grid.

2. Memorizing Facts and Information is more important for the pre-cast job than the cement finisher, being a requirement for most activities, whereas this skill applies only to the placing (levelling) stage of the cement finisher job.

3. Looking Ahead, Anticipating appears to be a central facet of the cement finisher job, but less relevant for the pre-cast.

4.. Interpretating Written, Pictorial and Diagrammatic Material does not seem very prevelant in either job - nor does Adapting to New Ideas and Systems.

5. Checking, Assessing and Discriminating is more important for the pre-cast labourer than for the cement finisher.

What this tells us in regard to training is:

If a worker is moving from the job of pre-cast labourer to cement finisher you will want to ensure that the area of "looking ahead, anticipating" is well covered by training. By the very nature of the job, seeing problems which could wreck a finish is absolutely essential. A combined literacy and technical skill training approach could focus on problem identification exercises and cause and effect reasoning.

If a worker is moving from cement finisher to pre-cast labourer, training might centre more on exercises or modules concentrating on "checking, assessing and discriminating". Knowing the effect that various mixtures and consistencies will have on a repair is basic. Visual acuity is a must and good spatial discrimination an asset. These aspects can be used to direct

training. If situations in which both oral and written problem-solving is required to underline aspects of this learning category, literacy training goals will be reached simultaneously with more technical training goals.

Since Ordering, Prioritizing and Planning are central aspects of both jobs, it may be desirable for trainers to ensure that this very central area is well covered by training in both instances. Sequencing exercises could be useful and these can easily be adapted to a variety of literacy applications.

It should be noted that while the Job Learning Analysis Grid is particularly suitable for examining transferability and promotability, it could also be used to examine training needs for new hires.

TRAINING APPROACHES BASED ON RESULTS ON THE JOB LEARNING ANALYSIS METHOD

The application of the Job Learning Analysis Method to the jobs of pre-cast repair and cleaning labourer and cement finisher yielded some important information about the skills required to do

these jobs and the various aspects of learning which can be applied to those skills. In addition, it yielded important information on job terminology which can be used to good advantage when preparing training materials. This approach led to establishing some form of comparability between jobs. When we had a comparison of the learning skills required to do the job of the cement finisher as opposed to the pre-cast repair and cleaning labourer, it was possible to identify the new skills, both technical skills and learning skills, that must be utilized effectively by the cement finisher. Training can then address the identified gap between the two jobs' skill levels. Literacy training, integrated into the trades training, will be an important part of the required training program to address this gap.

It is important to remember that the labourer job has many facets. An individual may be employed as a form worker, a mason tender or a cement finisher. As well the person may be required to use a fork-lift, and other power tools, cut and core, read blueprints, erect scaffolding, waterproof, excavate, sand blast and wall saw. Training in most of these content areas is provided at Labourers' Training Centres. If task analysis techniques can analyze these jobs both from the technical aspect and from the aspect of basic skills and learning strategies as well, it will be

much easier for the training centre administrators and trainers to refer workers to the appropriate next step in training and to know what other job areas in the range of jobs they are likely to be able to handle well with their present level of experience and training. It will also be easier for a labourer to identify further areas for training. Most important of all, the knowledge which can be gained from literacy task analysis will assist trainers to design curriculum which is trade specific while at the same time literacy sensitive.

Cement Finisher

MAIN ACTIVITY No.	Description	TIME SPENT ON ACTIVITY	PHYSICAL SKILLS	COMPLEX PROCEDURES	CHECKING/ASSESSING/ DISCRIMINATING	MEMORISING FACTS/ INFORMATION	ORGANISING/PRIORITISING/ PLANNING	LOOKING AHEAD/ ANTICIPATING	DIAGNOSING/ANALYSING/ SOLVING	INTERPRETING/USING WRITTEN/PICTORIAL/ DIAGRAMMATIC MATERIAL	ADAPTING TO NEW IDEAS/SYSTEMS
1.	Job prep		1	2	3	4	(5)	(6)	7	8	9
2.	Check site		1	(2)	(3)	4	(5)	(6)	7	(8)	9
3.	Placing and levelling concrete		(1)	2	3	(4)	(5)	(6)	7	8	9
4.	Finishing		(1)	2	3	4	(5)	(6)	(7)	8	(9)
5.	Curing (sealer)		(1)	(2)	3	4	(5)	6	(7)	(8)	9
6.			1	2	3	4	5	6	7	8	9
7.			1	2	3	4	5	6	7	8	9
8.			1	2	3	4	5	6	7	8	9
9.			1	2	3	4	5	6	7	8	9
10.			1	2	3	4	5	6	7	8	9

Figure 7 *The Job-Learning Analysis Scoring Grid*

Source: Pearn, M. and Kandola, R. (1988). Job Analysis - A pratical Guide for Managers. Institute of Personal Management. Wimbledon, London. p.49.

Case Study 4

Assistant Grocery Manager - Retail Sector

WORKPLACE BACKGROUND

The Assistant Grocery Manager who participated in this literacy task analysis worked in a conventional or medium sized food store. Located in a suburban plaza, the store has five departments: meat, bakery, deli, grocery and produce. There are approximately 130 full-time employees some of whom work on a night crew. The chain store is unionized and has had a long history of good relations with management. There is one manager and two assistant managers. The person who helped in this literacy task analysis exercise was classified as a junior assistant grocery manager.

Throughout the store there was a congenial working atmosphere with employees practising good public relations skills. Such activities as Safety Committee meetings held monthly and the development of an Employee Orientation Kit allowed workers to become involved in their job environment. In addition the store

had a training culture as evidenced by their Human Resource Training and Development Centre. Facilitators provide half day workshops at the store location on a wide variety of work-related topics to employees who are scheduled to attend on a rotating basis. As well the training centre offers seminars to front line workers on courteous service and other topics such as operating a new system of cash registers.

DESIGN OF ANALYSIS

The basic steps in performing the literacy task analysis included the following:

1) ***daily log technique***
2) ***risk assessment technique***
3) ***walk and talk technique***
4) ***flow chart technique***

The focus of this literacy task analysis centered around two basic exercises - finding out what the job is and finding out how the job is done in terms of basic skills. As a preliminary step

in finding out what the job of assistant grocery manager entailed, an interview was conducted with both the employee and employer. Based on the results of the interviews the worker was asked to keep a log of daily activities over a period of time. This was called the ***daily log technique***. From this log a list of task statements were written. In the second step, after a complete task inventory was compiled, the ***risk assessment technique*** was used to target selected tasks for further analysis. In finding out how the job is done the ***walk and talk technique*** was used to observe the sub-tasks and to identify equipment, materials, staff interactions and required basic skills. A final step in the analysis included the ***flow chart technique*** which resulted in a simple behaviour or decision path for the more difficult to learn tasks.

DATA COLLECTION

Both the employer and employee were interviewed using similar guideline questions as in **Case Study 1**. These interviews provided information about the type of duties performed on the job as well as an indication of some of the required basic skills. In addition

the interviews assisted the analyst in selecting the most appropriate ways of collecting additional job and literacy related information. Since many of the duties performed by the employee consisted of "managing staff" it would have been difficult and awkward to observe these supervisory activities and the amount of time spent on each task. Therefore for a week the employee recorded, in a small pocket notebook, his work activities with details and the amount of time spent on each task. These activities were recorded for one half hour intervals and important details were jotted down in point form. This was called the ***daily log technique***. In explaining this exercise to the employee several examples of how to record information were discussed. This information served as model entries in the log as well as a source of reference.

Once the employee had completed the log the analyst reviewed the daily entries assessing activity level and time. Next all key actions were underlined and a list of task statements were written. Collecting job information in this way resulted in a complete task inventory which was then verified with the employee. The next step in the literacy task analysis was the ***risk assessment technique***. This technique is used after the task inventory is

compiled to determine difficulty, importance, frequency, and special training required of each task. From this assessment the analyst was able to target selected tasks for further analysis. Using the ***walk and talk technique*** the analyst then observed the employee performing the selected tasks and further discussed with him the types of equipment, materials, sequencing of interactions and the required basic skills. Once this information was obtained the ***flow chart technique*** was used to develop a basic behaviour path for each major task outlining sequential actions and straightforward decisions.

RESULTS AND INTERPRETATION OF ANALYSIS

The information collected from the daily log provided the basis for developing the task statements and describing the job duties of a grocery assistant manager. After one week of keeping the log the employee felt that all his major tasks had been performed at least once. Figure 9 illustrates several entries made in the log on a given day. Important actions are underlined as a first step in writing the statements. Once the log was reviewed

FIGURE 9

Daily Log

POSITION: Assistant Grocery Manager

DATE: July 16, 1990

TIME (1/2 hr)	ACTIVITY	DETAILS (point form)
9:30-10:00	organize day staff	- check to see who is away - wrote list of jobs that needed to be done before deliveries - read mail
10:00-10:30	checked messages on computer	- entered code - read memo from head office - looked over daily specials
10:30-11:00	sent invoices and mispiks	- counted inventory - called warehouse - fixed mistake

as a first step in writing the statements. Once the log was reviewed and all activities noted the analyst categorized the information which resulted in a list of task statements. This list of goal directed activities appears in Figure 10.

FIGURE 10

Task Statements (a partial list)

1. Prepare daytime staff schedule
2. Assign day staff duties
3. Report customer complaints
4. Talk to sales representative
5. Write schedule
6. Read electronic mail
7. Check planogram
8. Operate telexon computer
9. Price items
10. Instruct individuals
11. Order products
12. Check store conditions
13. Fill shelves
14. Estimate time for jobs

In verifying the task statements with the employee it became evident that many of the tasks could be grouped into major duties such as supervising daytime staff, ordering products, operating the telexon computer and talking to customers. In determining which tasks to further analyze the employee rated each one in terms of difficulty, importance, frequency and special training required. Overall two major tasks received high rating scores on all factors as indicated in Figure 11. These tasks included assigning day staff duties and operating the telexon computer. Following the rating exercise each task was observed and later discussed to determine the sequence and types of basic skills required.

Using the flow chart technique a basic behaviour path was developed for each of the main tasks. Figure 12 illustrates how the chart was outlined for the task of **assigning day staff duties**. At the top of the chart we find four sub-tasks all found in one of the categories of the **Basic Skills Profile**:

* observing store conditions (Problem-Solving)
* reading staff schedule (Basic Literacy)
* checking messages (Basic Literacy)
* reading electronic mail (Problem-Solving and Basic Literacy)

FIGURE 11

Task Ratings

Task 2: **Assigning day staff duties**

	1	2	3	4	5
difficulty	very low	low	moderate	high	very high
importance	very low	low	moderate	high	very high
frequency	very low	low	moderate	high	very high
special training required	very low	low	moderate	high	very high

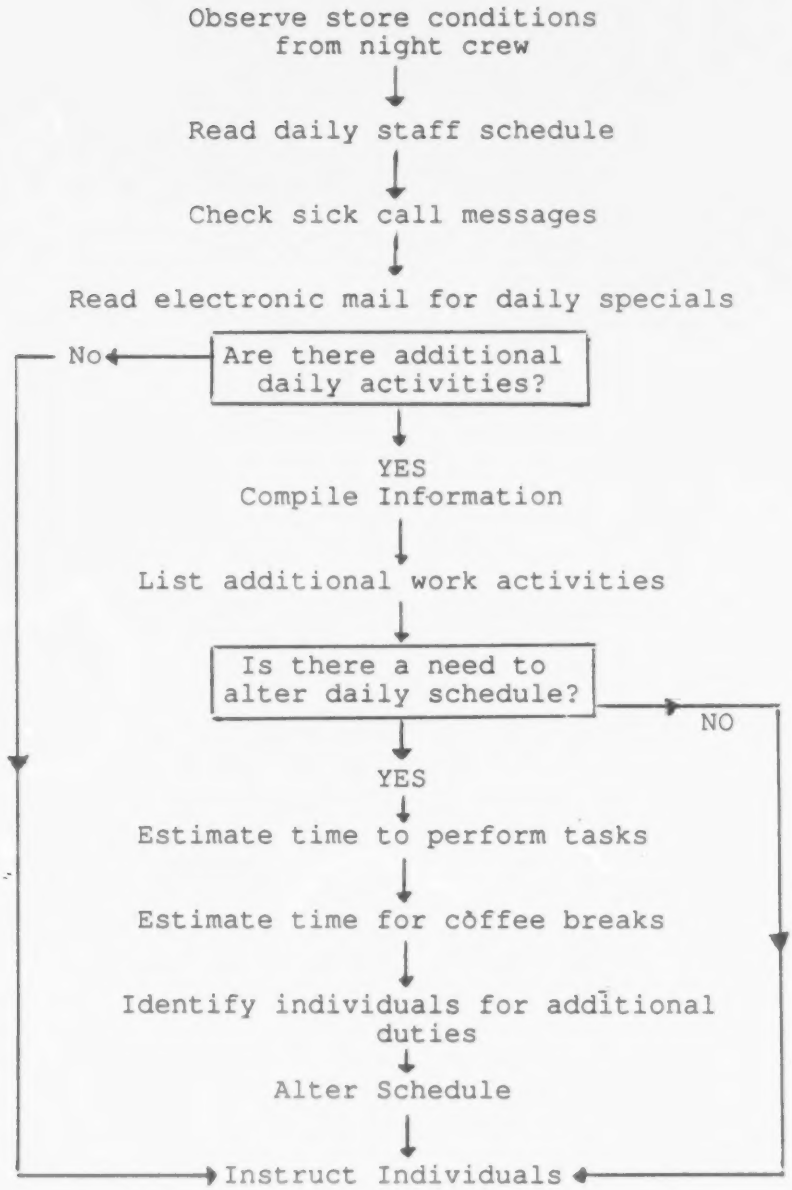
Task 8: **Operates telexon computer**

	1	2	3	4	5
difficulty	very low	low	moderate	high	very high
importance	very low	low	moderate	high	very high
frequency	very low	low	moderate	high	very high
special training required	very low	low	moderate	high	very high

FIGURE 12

Task 2

Assigning Day Staff Duties



It should be noted that these four sub-tasks along with the other ones in the chart represent the most likely performance flow or sequence of doing the major task.

Crucial to this main task of **assigning day staff duties** are the decision points which are found in the box in the form of a question. If the employee had determined that no additional activities were required,then he would continue to instruct individuals directly. This is indicated by the arrow along the left hand side of the chart. However, if additional daily activities were required then he would use the basic skills of compiling and listing and alter the daily schedule by estimating time and identifying individuals. Using the **Basic Skills Profile** each one of these sub-tasks can also be classified into one of the major categories:

* compiling information (Problem-Solving)
* listing information (Basic Literacy)
* estimating time (Basic Numeracy)
* identifying individuals (Problem-Solving)
* altering schedule (Creative Thinking)
* instructing individuals (Oral Communication)

As can be seen the result of this exercise is a task description that allows for each action to be translated into a basic skill needed to perform the duty effectively. It provides a good example of the steps and skills necessary to solve a staff scheduling problem, and in terms of job-related training materials the flow chart can be used as a learning aid along with the actual shop floor messages, schedules and electronic mail.

Case Study 5

Hog Pusher: Butcher and Butcher Supervisor

Wholesale Food Sector

WORKPLACE BACKGROUND

Quality Meat Packers in Toronto is a pork processing plant which employs some 650 workers most of whom are of ethnic origin, notably Portuguese. Jobs range from those which you would traditionally connect with meat packing - for example - butchering, cutting, boning and packing - to the supporting jobs of maintenance, welding, engineering and shipping. Over 4,000 hogs are killed and processed each day at Quality Meat Packers, with the products being distributed throughout Eastern Ontario and to export markets such as Japan.

The **Structured Job Analysis Interview Technique** as described in **Analyzing Jobs**, Pearn and Kandola, (London, England, 1988), was applied to the jobs of butcher, hog pusher and butcher supervisor. The purpose of analyzing these three jobs was to identify what incremental literacy and other basic skills would be required for an employee to progress from hog pusher, to butcher and then to butcher supervisor. Transferability of skills and promotability were thus main goals of this analysis.

METHODOLOGY

Pearn and Kandola (1988) have outlined a Do-it-yourself Job Task and Role (JTR) Method. While this method was not specifically targeted to a literacy application in the Pearn and Kandola work, it can be so adapted with very little modification. In effect, the Do-it-yourself JTR Method uses a Structured Job Analysis Interview, and according to those authors, *"the technique is designed to be used with very little training and to provide a good broad-brush picture of a job in a relatively short space of time"*. It is thus an excellent technique for managers to use who have limited time or skills to carry out a more complicated analysis process.

There are 33 questions in the Structured Job Analysis Interview form, many of which relate to literacy and numeracy. A review of the Basic Skills Profile will show whether additional questions are necessary. The Structured Job Analysis Interview form is found on page 175 in this chapter. General descriptions of the jobs of hog pusher, butcher and butcher supervisor which emerged from this analysis appear on pages 167 to 174. Note taking during the interview permitted the interviewer to obtain a good record of the major elements of these jobs, from which conclusions could later be drawn.

FOCUSING THE ANALYSIS

Even though there is at present little transferability between jobs - and even less upward mobility - the potential does exist to move from hog pusher (which requires strength) to a butcher and possibly butcher foreman. The butcher job requires less strength and more skill, and since entry to the job is sometimes through apprenticeship, there is a certain amount of book learning regarding the various cuts and their characteristics which could be part of a butcher's training. It must be said, however, that the butcher trade can concentrate on an almost total "hands-on" approach which requires little reading.

There does not appear to be a large number of traditional literacy skills required for either job. Physical strength is the main requirement of the hog pusher and physical skill the main requirement of the butcher job. Both jobs require teamwork and working quickly (as one would expect in what is basically a production line operation). It seems that the point at which incremental skills are used is at the butcher foreman level.

If one applied a narrow focus literacy task analysis to the jobs of hog pusher, butcher and butcher foreman, one would deal only with a few packing forms and box labels. If one looked at the

total basic skills profile, however, one could see how teamwork and personal management skills are important in these jobs. In comparing the hog pusher and the butcher, one can conclude that problem-solving tends to be sporadic rather than regular in both jobs. Both jobs lend themselves to a certain rhythm; however, there is probably a greater likelihood of problems and delays occurring in the hog pusher job, since large carcasses sometimes fall off the rails. The butcher foreman job requires developed problem-solving skills to be able to react to sudden unexpected situations which may result in a temporary stoppage in the production line.

APPROACHES TO TRAINING

How can the above information be used to upgrade skills levels of workers? There are two approaches.

1. Direct the training for incumbents of hog pusher and butcher at the skills which would be required at the butcher foreman level - for example - knowing forms, arithmetic, writing short reports, comprehending written instructions via memo. Prepare for mobility and transferability.

2. Institute training which will build upon the skills that incumbents of the positions are already using on their jobs (but which could be improved with training). Training in teamwork skills and time management would help incumbents do their jobs better. Focussing on problem-solving skills through exercises and simulations (oral at first) could help workers build up their problem-solving skills while at the same time building self-confidence. Help could then be provided to do such exercises in a simple written format.

ADVANTAGES AND DISADVANTAGES TO EACH APPROACH

Approach 1 - Directing training to higher level skills:
Clearly, not all entry level employees aspire to be a foreman. Some employees are content to stay where they are. Also, some employers are content that these employees should stay where they are and do not promote further training. If an employee perceives that he is being trained toward a limited number of higher order positions - with little likelihood of reaching them - this could cause frustration. On the other hand, this kind of training could be helpful and extremely motivational to some employees who may welcome the opportunity to consider transferability or promotability.

Approach 2 - Building up skills needed in the present position: This approach uses simulations to create typical workplace situations which could happen during the incumbent's workday. The purpose of the simulations is to get the worker to explore options he could take when faced with certain scenarios at work. The problem-solving exercise encourages workers to think more creatively about possible problems they could encounter on the job. The commentary on the Grocery Store Receiver in the earlier case study gives some detail on how this method works and how the trainer can move gradually from an oral approach to problem-solving to a "reading and writing approach" built upon the degree of mastery of English that the job incumbents have. The goal behind this approach to training is to stimulate workers to a greater understanding of the importance of their own job and the ways in which literacy skills add to this self discovery. The confidence gained through the simulations will give workers a new respect for their problem-solving capacities and will possibly lead to heightened career aspirations.

The union can be counted on to help workers in regard to both approaches, since whether skills relate to doing the job better or moving on to a new job, workers with heightened skills can be counted upon to be more confident and participatory. This participation will lead to a greater awarenes of rights and a better understanding of the collective agreement.

A COMMENT ON THESE APPROACHES

Both these approaches to training require that the worker get "off the line" and into a classroom or other workplace training location. A quality circle approach may even be desirable.

Employers may not immediately see a payoff and may be reluctant to pursue this type of training. However, while payoffs may not be immediately evident, such training should lead to:

* greater knowledge of the job
* augmented teamwork
* increased capacity to problem-solve
* heightened interest in improving basic skills.

It should be noted that literacy task analysis in Approach 1 is used to train an employee for a new job, while in Approach 2 literacy task analysis is used to help an employee maximize his present job.

It may be that the two approaches are not exclusive, and that the two approaches could be combined. Perhaps greater discovery of the elements in the present job (simulations, Approach 2) could be

the beginning step, with gradual adding of new elements such as dealing with forms, calculations, higher order reading and writing skills, etc. In this way a bridge to a higher order job has been created. It is important to note, and this cannot be stressed too much, that the trainer is not teaching the higher job, but just the level of literacy skills required to do that higher level job.

A FINAL NOTE

How to use a literacy task analysis is just as important as knowing how to conduct one. Findings from the literacy task analysis of jobs in the meat packing plant will assist in the design of a training program. The simple Structured Job Analysis Interview approach will be an easily usable vehicle should the company decide to take the analysis to other job departments.

A veritable **Skills Ladder** can be created through literacy task analysis and the way in which it permits a targeted approach to skills upgrading. The descriptions of the job of hog pushers, butcher and butcher supervisor that follow indicate the way in which the Structured Job Analysis Interview, in conjunction with the Basic Skills Profile, provides a snapshot of these very different yet related jobs.

DESCRIPTION OF THE HOG PUSHER OBTAINED THROUGH A LITERACY TASK ANALYSIS

The individual interviewed was one of four employees known as the hog pusher. These employees work from 6:30 to 3:30 Monday through Friday. The hog pusher is, as the name suggests, a person who "pushes" lines of hogs attached to a pulley. Nine to twelve hogs are pushed along at a time on their way from the freezer to the cutting room, where they are cut into pieces such as butts and New Yorks, and weighed. The meat moves along a conveyer past butchers who stand in position to do the various processes. The hog pusher is vital in this work, since his job ensures that the meat is moved along quickly and that the production line does not slow down. It is important that there not be an overload in the freezer at the end of the day since this will affect numbers "processed" on the killing floor.

Physical strength is a key aspect of this job, as sometimes the wheels of the belt line do not wish to push, and exertion using both knees and hips is required. The work proceeds at a steady pace during the day. Each worker has one hour for lunch and two fifteen minute breaks. Other "down" time occurs occasionally if the cutting machine stops for some reason. No tools are required

to do this job except a knife. (Sometimes the hog pusher must cut a hog in half.) Over 4,000 hogs are killed a day and over 4,000 a day are cut up in the cutting room.

There is not a great need for reading, writing or numeracy in the job of hog pusher except for limited applications as follows:

At the end of the day the hog pusher counts how many hogs, sows and incomplete carcasses are left. This count is done in three large freezers known as "chills". Chill 1, the freezer where carcasses are stored immediately prior to cutting, holds 100 hogs. Chills 2 and 3 are large. Chill 2 has three separate freezers with three doors and holds 340 hogs. Chill 3 is for "incompletes" and sows. The number in each "chill" is noted by the hog pusher and given to the foreman.

There is a requirement for accuracy in estimating numbers which will be needed to fulfill the day's complement. At quarter to three the hog pusher must estimate how many more hogs to push in - since a hog is cut every seven seconds. If too many hogs are pushed in, they will have to be moved back to the freezer at the end of the day, which is time-consuming and unnecessary if proper planning takes place. Planning is also important in the morning when it is necessary to decide how many hogs to remove from the freezer at a time so that fresh ones can be put in.

No graphs, pictorial representations or charts are used by the hog pusher. The hog pusher counts items form time to time to fill boxes - for example - 30 heads are put into a box and weighed. The hog pusher could be requested to assemble three hog sides, 30 heads and two boxes of leaflard, which are then weighed by another employee. Boxes are on tracks. The hog pusher is required to write on boxes - for example - heads, New Yorks, leaflard, and then place the boxes on skids which he then transports to the elevator. From there it goes to an employee who affixes stickers with weights indicated.

Care regarding safety is important for the hog pusher, as hogs can fall off the line at times. Teamwork is also important, with coordination between the hog pusher in the freezer and those at the forklift.

After training, the job becomes routine.

DESCRIPTION OF THE BUTCHER OBTAINED THROUGH A LITERACY TASK ANALYSIS

The inter-departmental butcher interviewed is one of ten employees in that position. There are also four foremen (former butchers). The butcher works in the cutting room and cuts up pork into side ribs, hams, New Yorks, middles and loins. This is done on a production line. The employee interviewed had received his butcher training abroad before emigrating to Canada. No Canadian apprenticeship was required. Canadian training at Quality Meat Packers was provided by the foreman with two years to go to the full rate of pay. Apprenticeship rates increase every six months and then every three months.

Tools used are knives, saws, and drawing knives which are rectangular knives. Every butcher is responsible for sharpening his own knife - generally once every two weeks on the big sharpening stone, and once a day on the smaller stone. Not a great deal of physical strength is required, and there is not much heavy lifting, but speed is definitely required. If the knife is not sharp enough, work is slow. There is no pressure as such, since there is a rhythm to the work. There is no writing required on the job and no reading specific to the job. There is, however, general workplace reading such as labourers' and packers' reports.

The inter-departmental butcher gets paid one dollar an hour more than regular butchers. There are 10 inter-departmental and 60 to 100 regular butchers who work in the boning room and the cutting room.

Accuracy is an important aspect of the butcher job. It is important not to leave much wastage on the bone. Work is routine except when the foreman gives special orders from certain customers who want a certain cut. While the butcher does not have a great deal of report writing, the foreman does. It should be noted that some butcher jobs will involve packing as well as cutting. There is both individual effort and teamwork involved. The butcher foreman has to do calculations and prepares forms and paperwork, but the butcher per se does not. Speed is the most important part of the butcher job - plus a low wastage rate.

DESCRIPTION OF THE BUTCHER LINE SUPERVISOR OBTAINED THROUGH A LITERACY TASK ANALYSIS

The line supervisor is the foreman. There are five foremen in the Fresh Pork Department. The Fresh Pork Department has 151 employees.

The foreman or line supervisor interviewed was one of three foremen who work in the cutting room.

The Cutting Room has 97 employees (3 foremen).

The Boning Room has 30 employees (1 foreman).

The Sow Room has 10 employees (1 foreman).

The Offal Room has 3 employees.

The foreman interviewed supervises a variety of workers - forklifters, packers, hog pushers and butchers. The first three are in the labouring category. Occupants of the line supervisor position often begin as a labourer, then progress to butcher and foreman. Foremen participate as instructors in training courses. A six month long night shift training course is being developed which will train 11 employees (midnight to 8:30 a.m.).

There is a considerable amount of paperwork involved in the foreman job. This paperwork includes the following areas:

* number of hours worked for all employees supervised
* accident reports
* safety warnings
* late forms
* suspension sheets
* evaluation forms - generally checking off categories with brief comments

There will also be memos received from time to time regarding trying out new products or customizing orders - for example - special orders from Japan for red meat only. In terms of calculations, it is generally simple maths - adding, subtracting - no fractions, decimals or such operations. The foreman's job begins at 5:30 a.m. when he comes in preparatory to the "line" starting at 6:00 a.m. He must ensure that each station is filled, and if not, get a person or persons from the boning room to fill it. Then the absentee sheets must be filled in with the names of absentees.

Also required at the beginning of the day, the forman records how many people there are in each department. The main duty is watching lines, generally from a high table, and timing lines. The foreman has to make sure that the work is being done properly. Interpersonal skills are a key element of this job - teamwork and motivation building. The company has provided a small training program on "people" skills.

Crisis management is important in this job - what to do in the event of a breakdown. For example, last year when the table broke, besides calling maintenance, the foreman had to ensure that the workers were gainfully occupied during "down" time - which involved

getting some product from the cooler and commencing "boning" on that product. In order to know what to do in a crisis, the foreman needs to know the whole process - and how many pieces can be done in a certain time. Direct performance in the cutting room should be 80% - for example - correlation of pieces and hours.

Labour Data Collection occurs in each department and goes to the clerk. Indirect and direct hours are calculated by the line supervisor for each employee supervised. The Data Collection form is filled in every hour. The standard is 7.5 hogs an hour.

Communication, particularly oral, is important. Most communication is within the department, but there is liaison with other departments as well and other plants. Many of the workers are Portuguese. Many are not interested in ESL since they generally work in their own language. Each foreman goes to a WHMIS course while labourers are not required to know WHMIS beyond the various danger symbols.

A natural progression for the line supervisor would be to proceed to Line Superintendent. An even higher degree of reading and writing is required in that job. Report writing skills would be an asset in the Superintendent position. Writing appears to be a greater need than reading, as fairly comprehensive reports such as the results of test runs are required from the Superintendent.

STRUCTURED JOB ANALYSIS INTERVIEW

Place in the organization

1 What is your job title?
2 What department do you work in?
3 What jobs are immediately above yours?
4 What jobs are immediately below yours?

Main objective

5 What do you see as the main objective of your job?

Main duties

6 (a) What are your main duties/activities?
(b) How important are each of these to your work?
(c) What proportion of your time do you spend on each of these duties?

Duties and responsibilities

7 (a) What tools and equipment do you use?
(b) What do you use each of them for?
(c) How important are they to your work?
(d) How often do you use them?

8 (a) What aspects of your work require physical effort, i.e. carrying, pushing, pulling?
(b) What do you have to do?
(c) What sort of weight/force/pressure is involved?
(d) How often do you have to do this?

9 (a) What written materials do you use as sources of information, e.g. notes, reports, articles, etc?
(b) What do you use them for?
(c) How important are they to your work?
(d) How often do you use them?

10 (a) What writing do you do, e.g. reports, letters, memos?
(b) Who do you generally write to?
(c) Generally, what is the content of the written work?
(d) How do you decide what you have to write?
(e) How often do you have to write things?

11 (a) What materials do you use involving figures, tables of numbers, etc?
(b) What do you use them for?
(c) How important are they to your work?
(d) How often do you use them?

12 (a) What figure work/calculations do you have to do?
(b) What do you have to do it for?
(c) What is the highest level of arithmetic you require (e.g. working with decimals and fractions, algebra, etc)?
(d) How often do you work with figures?

13 (a) Do you use graphs, pictures or pictorial materials in your work?
(b) What do you use them for?
(c) How important are they?
(d) How often do you use them?

14 (a) Do you ever have to produce maps/charts/diagrams, etc?
(b) For what reasons?
(c) How often do you do this?

15 (a) Which aspects of your work, if any, require you to work accurately?
(b) What would the consequences be if you were not accurate in those areas?

16 (a) What other sources of information do you use in your work?
(b) For what reason?
(c) How important are they?

17 (a) Are professional qualifications required for this job?
(b) What level of education is needed to be able to perform this work?

18 (a) Is previous experience required to perform this job?
(b) If yes, what sort of experience is required? Be as specific as you can.
(c) Why do you think that?
(d) What is the minimum amount of time in which a person could have obtained such experience?

19 (a) How much supervision do you receive?
(b) How much contact do you have with your supervisor?

(c) How does your supervisor know if your work is up to standard?

20 (a) How many people do you supervise?
(b) What does that involve?

21 (a) How do you decide the order in which to carry out your work? (i.e. is it predetermined or are you free to set your own priorities?)

22 (a) What planning or organizing do you have to do?
(b) What do you have to do it for?
(c) How important is it to your work?
(d) How often do you have to do it?

23 (a) How responsible are you for the safety of others?
(b) What does this involve?
(c) How important is this?

24 (a) What sorts of assets, material, money are you directly responsible for?
(b) What does this involve?
(c) How important is this?

Contact with others

25 (a) What people do you come into contact with in the organization?
(b) For what reason?
(c) How important is contact with each of these people?
(d) How often do you come into contact with each of these people?

26 (a) What people from outside the organization do you come into contact with?
(b) For what reason?
(c) How important is contact with each of these people?
(d) How often do you come into contact with each of these people?

27 (a) Is there any negotiating/interviewing/training/public speaking involved?
(b) For what reason?
(c) What does it involve?
(d) How important is it?
(e) How often do you have to do it?

28 (a) What are the major forms of contact (e.g. personal contact, telephone, letters, memos, etc)?
(b) How important are these forms of contact?
(c) How often do you use them?

Physical environment

29 (a) Is the majority of your work indoors or outdoors?
(b) What proportion of time is spent indoors/outdoors?

30 (a) How many people do you work with most of the time?

31 (a) What are the physical conditions like (e.g. light, heat, space, etc)?

32 (a) To what extent do routines and procedures have to be followed?
(b) For which activities?
(c) How much time do you spend working under such routines and procedures?

33 (a) What are the prospects for future development?

Extract from:

Job Analysis, A Practical Guide for Managers, Pearn, M and Kandola, R., Institute of Personnel Management, Wimbledon, London, 1988, p. 126-129

VARIATIONS IN USING LITERACY TASK ANALYSIS TO CREATE A CAREER LADDER BASED ON BASIC SKILLS DEVELOPMENT

There are several scenarios which could result in literacy task analysis being used to create a career ladder based on the identification of basic skills in two or more jobs. The information given in regard to the three jobs cited in the meat packing company provides one example. Here are several others:

SCENARIO 1

A significant number of employees have been doing the same job for a great number of years. While they are fully knowledgeable of that job at this point in time, they are becoming restless. For some of these workers, the seeming lack of opportunity for new challenges has been a nagging problem. For others, back injuries and other physical discomforts have resulted from doing the same job over and over for such along period of time. These workers wonder if their health will be able to withstand very many more years in the same job.

These situations have been discussed recently at a union led quality circle program which focused on the questions: *"What do you want from your job?"* and *"What kind of workplace do you want*

to work in?". It became clear at the quality circle discussion that many workers were unaware of what additional skills they would need to progress to another job in the company. In addition, the quality circle's consensus very clearly indicated that workers were anxious to be considered for new opportunities, and just as clearly, many of them were reluctant to come forward to actively seek opportunities of which they knew only the vaguest dimensions.

The union decides to take this situation to management and to request that a literacy task analysis be conducted in order to identify the incremental basic skills which would be required for worker progression. The union is aware that there has been a degree of mistrust of literacy task analysis owing to the fact that it has been misused in the past and has been used to identify worker "deficiencies". The union knows, however, that the union itself will be able to use the method in ways which foster employee growth and well-being. The union intends to use that analysis to design and implement training programs for workers. The union intends to design the training in such a way that there is a balance between job dimensions and personal development dimensions. The union will involve workers in the program's development.

SCENARIO 2

The adult educator is in a reflective mood. She has many years experience as an adult educator in a variety of education settings. She reflects on the opportunities she has benefitted from during International Literacy Year to get involved in new and innovative literacy initiatives. She has attended Literacy Institutes with a workplace literacy component and Public Policy Forum seminars and dinners which brought together business, labour, community workers and educators in a joint exploration of basic skills needed in a variety of settings. She has explored the literature surrounding organizational needs assessments and literacy task analyses and has attended training workshops on these subjects. She has done a lot of thinking about how the various workplace partners would coalesce around the subject of basic skills training and what her role would be as a training resource. She has thought through issues surrounding employee confidentiality and learning involvement.

In short, she feels she is now competent to help in setting up specific workplace training. She has already visited several large and medium sized companies in the area to see if any of them would

be interested in embarking on a basic skills training initiative. It would be really helpful to do a career ladder through literacy task analysis. *"I'm ready."* she reflects. *"Now if only one of those personnel managers would call..."*

SCENARIO 3

Alarm bells are going off in the company's personnel office. The personnel manager is reviewing worker files and does not like what he sees. Worker compensation claims and absenteeism forms are increasing for workers in one of the company's divisions. A review of the files shows that many of the workers in the division have been at the company for more than fifteen years, and indeed some of them for over 25 years. The review also shows that many of these workers have had only one promotion in all their years at the company. Many of them, in fact, remain in the job for which they were hired many years ago. This division has a high proportion of labour intensive jobs which were considered highly attractive to immigrant workers seeking their first job in a new country with a new language.

While everything was going smoothly the personnel manager did not worry too much about these workers' place in the company. But now, in face of mounting compensation claims and absenteeism reports, it is obvious that something is wrong. The personnel manager decides that it is unrealistic to expect aging workers to carry the same physical load as they did in earlier years. He also decides that these workers have been loyal to the company and deserve to get something back.

Training is the answer. If workers could be promoted into higher level positions there would be an avenue for them to escape some of the more physical aspects of the most basic jobs. But do these workers have the basic skills needed to progress? It is with a sense of shock that the personnel manager realizes that he does not even have adequate job descriptions which reflect the main duties of each job - and certainly there is only the foggiest idea of what level of basic skills is needed in the various jobs within the division. This manager recalls having heard something about a "career ladder through literacy task analysis" Oh yes, it was form the adult educator from a community college who called on the company a few weeks ago. We really didn't pay much attention to her then, he muses - but still... He picks up the phone to call the union local President. He wishes to discuss the situation with

him, and then if reactions are positive, to seek an education resource who could assist in a training initiative based on literacy task analysis.

HOW TO COMBINE INTERVIEW AND DOCUMENT REVIEW TO OBTAIN A LITERACY TASK ANALYSIS

A literacy task analysis of a bakery clerk was conducted using the interview note technique. This bakery clerk worked with products which were already prepared in pre-baking form, rather than a "scratch" bakery which starts with all the raw ingredients.

The following literacy elements were noted:

Reading Requirements:

* Read temperature settings on stove
* Set timers
* Read ingredients lists
* Read break out sheet which shows numbers of each item baked
* Read instructions on cleaning products.

Writing Requirements:

* Write short notes to give status information for shift changes, for example, "The cinnamon buns in the proofer need to be baked.

Numeracy Requirements:

* Punch in numbers on machine, such as Code 560 for white bread, and number (30). The machine will give 30 tags with Price, White Bread, Date.

* Calculate prices. If there are extra muffins, for example, beyond the number going into packages, they must be packaged and priced individually rather than through pressing the code number on the pricing machine. Multiplication and division are necessary.

Additional Basic Skills:

* Advising customers. Customers with allergies may require the bakery clerk to check ingredients of products by reading lists on labels and boxes.

* Scheduling and sequencing. Timing is important to avoid "underproofing" (undercooking) and "overproofing" (overcooking). Establishing sequence of activities and sticking to a schedule is important so that once an item

is out of the oven any additional requirements will be handled promptly, such as moving product expeditiously from oven - to finishing with glazes or fillings - to packaging - to placing on shelves.

The above information was obtained in a short interview. A brief observation was done in the in-store bakery, and the bakery supervisor was interviewed briefly to set the bakery clerk's work within the broader context of the bakery and of the store.

In a subsequent exercise, the analyst reviewed a bakery manual for the training of bakery managers. While the manual was of a manager position rather than a clerk, it gave insight into many dimensions of the bakery clerk job. In particular, it provided insight into the importance for all persons involved in a bakery to have knowledge of the following areas:

* chemical processes which affect baking
* different kinds of flour and how their properties affect baking product
* baking problems and their causes
* the parts that ingredients play

* the variables of temperature and time
* the affect of room temperature on product quality
* rules of sanitation and hygiene in the bakery
* common types of pests which could invade flour and how to ensure they do not enter the workplace
* quality control
* people skills

Further information on these dimensions cannot be provided here due to confidentiality of the manual information. However, this list of subject areas indicates the type of information which can be found in existing training documents.

A review of such documentation will have the following benefits for the trainer.

1. The trainer will gain a fuller appreciation of how a bakery clerk's functions fit within the general domain of bakery work.

2. The trainer will be able to identify environmental aspects of the job which may have been only partially appreciated through the literacy task analysis interview

and will be able to assess the degree to which knowledge and experience in these areas affected decisions made on the job. This whole area of "prior knowledge" is crucial in analyzing jobs.

3. The trainer will be able to assess how the literacy task analysis interview can provide additional input to training design and materials development. Are there items which can be added to manuals?

4. The trainer can assess what additional basic skills will be necessary for promotion within the bakery field and ensure that this is reflected in training design.

5. The trainer will be able to prepare a more comprehensive description of the job than would otherwise be the case and provide input which will be helpful to employment counsellors and personnel managers who meet with potential entrants to this job field.

6. The trainer will gain knowledge of the job which will assist in simplification of materials and Plain Writing approaches to materials revision.

In short, the analysis of documentation such as technical content manuals can provide an excellent opportunity to examine how basic skills and technical skills intersect and how document review contributes to the understanding of jobs and tasks and the basic skills elements found within jobs and tasks.

Chapter 4

USING THE PROJECT RESULTS IN DIFFERENT OCCUPATIONAL SECTORS

In any project that attempts to "break new ground" there are always strengths and limitations to both the method of inquiry and generalizability of the final results. Such was the case in this project. One of the strengths of this exploratory work was that the topic of literacy task analysis has been investigated within the larger context of workplace basic skills training. To better understand the methodology underlying literacy task analysis, the project report has provided an overview of current trends in training, a description of recent workplace initiatives and a précis of the domain of job and task analysis. This information gives the reader a foundational background to help make decisions on how to improve workplace programs through literacy task analysis.

A second strength of the investigation is that the more usable techniques and methods for the collection and basic skills analysis of job information have been simplified. These techniques have then been applied in different occupational sectors to demonstrate the various ways of conducting a literacy task analysis. Each case study has illustrated one of the major reasons for performing such an analysis - learning new tasks, transferability and promotability.

Thirdly, this work has provided numerous suggestions for improving basic skills training by using the results of a literacy task analysis. The different case studies with accompanying interpretations of the results have guided the reader through various approaches of how to develop job related basic skills curriculum. In other words, the findings of the project can be viewed as a collection of road maps - all providing directions for the improvement of workplace training.

One of the problems inherent in the design of the project is that these different methods and techniques for conducting a literacy task analysis have yet to be implemented or practised in any workplace literacy program. Although this activity is beyond the scope of the project it is difficult to say which techniques, approaches or methods have actually worked in developing job-related basic skills training. The true test of their effectiveness can only be reported after trainers use them in developing workplace literacy programs.

Another limitation of this project is the number of occupational sectors studied using these various literacy tasks analysis techniques. As presented in Chapter 3, only occupations within the automotive repair service sector, the retail sector, the

construction sector and the wholesale sector were investigated. In an attempt to deal with this limitation a survey of managers and union leaders in nine additional occupational sectors was conducted. The purpose of this survey was twofold. First, it was intended to determine the applicability and usability of the various literacy task analysis methods in potential workplace situations. Unionized, non-unionized, medium sized and large workplaces in the hospitality, education, finance, retail, manufacturing, natural resources, transportation, construction trade and health care sectors were surveyed. The wide range of differing workplaces provided a variety of settings and circumstances to determine the potential application of literacy task analysis methods to improve basic skills training. Second, it was intended to demonstrate how a workplace trainer could apply the information on literacy task analysis using both the Technical Report and the Manual - in other words, to see if there was sufficient explanation of the methods and techniques and their applicability so that practitioners would be able to use the information in logical and creative ways.

The results of this exercise are summarized on the chart which begins on page 195. SITUATION refers to the occupational sector and a job scenario, TECHNIQUES refers to methods of collecting and

analyzing job information in relation to basic skills requirements and RATIONALE refers to the underlying reason or explanation for choosing a particular technique. For readers requiring additional information, **Appendix A** (see page 207) provides a narrative text of the hypothetical situations summarized in the chart.

Stated briefly, several observations can be made from this survey exercise. There is no formula or approach which would indicate that one technique or another must be used in a given situation. Some techniques, however, do provide certain types of basic skills information and point clearly to particular training goals. In certain cases, a series of techniques taken together form a unit for effective information collection and analysis (observation-interview, daily log, risk assessment, walk and talk, and flow chart). This unit can be used as a complete literacy task analysis strategy or a technique within a unit can be used separately depending on the workplace circumstances. Finally as hoped, the exercise permitted a workplace trainer to develop a literacy task analysis design for specific training needs. Using both the Manual and the Technical Report the practitioner was able to take the information and apply it to a wide variety of workplace contexts with considerable ease.

Chart 1
Literacy Task Analysis and Applicability to Nine Occupational Sectors

SITUATION	TECHNIQUES *	RATIONALE
1. HOSPITALITY		
Situation 1. Learning New Skills - Room Attendant		
Housekeeping department has introduced new computer system. Employees have difficulty accessing instructions from computer due to the high level of basic skills required.	Interview-Note Technique	* easy to conduct * gives good overview of the job and major duties requiring basic skills to be observed * recognizes the expertise of the interviewees and provides ownership to the the process; breaks the ice and develops rapport
	Task Matrix	* provides a breakdown of how the job is done in terms of basic skills
	Basic Task Description Technique	* provides a detailed analysis of basic skills required for a training program

* Observation is a key element of a literacy task analysis and should be used whenever possible. Therefore, it will not be repeated in the chart for every situation.

SITUATION	TECHNIQUES	RATIONALE
Situation 2. Learning New Skills - Guest Contact Positions		
Hotel wants to make employees more responsible for decision-making in guest contact positions.	Structured Job Analysis Interview	* adaptable to the workplace * provides information on <u>new</u> skills required for guest contact positions within the present context
	Risk Assessment Technique	* determines perceptions of the importance and difficulty of new skills required; this is essential when planning the training
	Flow Chart Technique	* provides a visual breakdown of how a customer complaint can be handled

SITUATION	TECHNIQUES	RATIONALE
Situation 3. Promotability - Back of the House (Non-Guest Contact Positions)		
The employer wishes to promote employees to supervisory and management positions. Basic skills upgrading opportunities will be an important component of the strategy.	Interview-Note Technique	* can be conducted with employees who may have language problems
	Task Matrix	* provides enough detail on the basic skills needed for the job
	Daily Log	* provides task statements in terms of basic skills
	Observation-Interview	* an alternative to finding out what the job is

SITUATION	TECHNIQUES	RATIONALE
Situation 4. Promotability - Room Service to Dining Room		
The hotel wishes to promote employees in room service to waiter positions in the hotel dining room.	Learning Analysis Scoring Grid	* analyzes responses and compares similarities and gaps in skills needed to move from one position to another.
2. EDUCATION		
Situation 1. Learning New Tasks - computer systems		
Basic skills upgrading is needed for employees to operate new computer systems.	Interview-Note Technique	* gives overview of the job and major duties requiring basic skills to be observed
	Task Matrix	* provides overview of duties performed and competencies
	Basic Task Description Technique	* gives a further breakdown; isolates the basic skills needed for each task element

SITUATION	TECHNIQUES	RATIONALE
3. FINANCE		
Situation 1. Learning New Skills - Computer Programmers		
	Structured Job Analysis Interview	* as first step, provides a detailed overview of the entire job
	Job Function Technique	* provides differentiation between people, information and functions requirements; isolates the importance of oral communication vs. the technical aspects of the job
	Daily Log	* enhances the information already collected by providing more detail on the people function basic skills

SITUATION	TECHNIQUES	RATIONALE
Situation 2. Promotability - Data Entry Clerks Employer would like to promote the data entry clerks into other jobs.	Interview-Note Technique	* gives overview of the job and major duties requiring basic skills
	Task Matrix	* provides further breakdown of competencies of the job
	Basic Task Description Technique	* isolates the basic skills needed for each task element; provides necessary detail

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SITUATION	TECHNIQUES	RATIONALE
4. RETAIL		
Situation 1. Learning New Skills - Clerks in Retail	Structured Job Analysis Interview	* provides detailed information on the customer service skills and math skills required by sales clerks
	Observation-Interview	* allows for questioning to better understand how the basic skills are used
	Task Matrix	* breaks down the information from the Structured Job Analysis Interview into basic skills competencies needed on the job
	Basic Task Description Technique	* further isolates basic skills needed

SITUATION	TECHNIQUES	RATIONALE
5. MANUFACTURING		
Situation 1. Learning New Skills - Process Engineers, Equipment Technologists and Operators	Interview-Note Technique	* respects the organization concerns about time; other introductory techniques might take longer * gives overview of the job and major duties requiring basic skills to be observed
	Flow Chart Technique	* provides a diagrammatic representation of workplace communication; useful for analyzing teamwork skills

SITUATION	TECHNIQUES	RATIONALE
6. NATURAL RESOURCES		
Situation 1. Using Literacy Task Analysis to Ensure Equal Opportunity in Training	Interview-Note Technique	* provides overview of major job duties
	Basic Task Description Technique	* provides detailed information on the basic skills requirements for training; helps to determine a strategy to address the upgrading needs of the workers

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SITUATION	TECHNIQUES	RATIONALE
7. TRANSPORTATION		
Situation 1.		
Older workers are having difficulty with their customer service training due to a high level of basic skills needed to complete the training.	Interview-Note Technique	* easy to conduct and addresses the need to respect time constraints of the organization
	Task Matrix	* helps organize information
	Basic Task Description Technique	* analyzes task elements in terms of basic skills requirements for the training

SITUATION	TECHNIQUES	RATIONALE
8. CONSTRUCTION TRADE **Situation 1.** The union in joint partnership with management is setting up a new training centre and wishes to ensure that basic skills upgrading is an integral part of training offered to its members.	The Learning Analysis Scoring Grid Basic Task Description Technique	* provides a skills progression among the three job categories and enough detail within each category * provides more detail on the basic skills and knowledge needed in each of the three areas being analyzed

SITUATION	TECHNIQUES	RATIONALE
9. HEALTH CARE TRADE **Situation 1.** The hospital wishes to integrate reading and writing skills into a new supervisory course for supervisors in the Housekeeping Department.	The Interview-Note Technique	* provides an overview of the job and the reading and writing skills needed on the job
	The Job Function Technique	* shows the relation of reading and writing to other activities required of supervisor
	The Basic Task Description Technique	* provides more detail on the reading and writing skills needed by supervisors on the job

Appendix A

THE APPLICABILITY OF LITERACY TASK ANALYSIS TO A VARIETY OF WORKPLACE SITUATIONS IN EIGHT OCCUPATIONAL SECTORS

The purpose of this section of the Literacy Task Analysis Technical Report is to suggest the applicability and usability of various job information collection techniques in workplace situations in eight occupational sectors. In addition, the aim is to show that a service provider of basic skills upgrading programs can conduct a literacy task analysis without spending "scads" of time researching techniques. After a review of the different techniques and careful thinking about how the techniques apply to a given workplace situation, a service provider should be able to conduct literacy task analysis comfortably and competently. As well, this section has been developed to illustrate how literacy task analysis might be used in both unionized and non-unionized workplaces in a variety of different situations.

Although the scenarios for the occupational sectors involve medium-sized and large workplaces, the techniques used could be applied in small workplaces with up to ten employees easily with

some modifications. For example, the analyst will need to be flexible in terms of when the literacy task analysis is conducted and how long the analysis will take. In a small workplace, the analyst may have to determine creative methods of observation or alternative methods to observation such as observation-interview techniques.

The service provider of basic skills will be able to determine techniques that might be suitable in a given situation based on the culture of the workplace, changes the workplace may presently be going through and the degree of sophistication of the basic skills required.

Suggestions made in this section are based on the premise that training needs have been or will be properly assessed and that basic skills issues have been identified and considered within the context of other workplace issues with which they occur. This will provide information on the areas where literacy task analysis can most appropriately be used and which jobs could be analyzed. However, other methods of data collection such as participation of workers in identifying in what they want and need to learn is essential.

Literacy task analysis should be seen as a way to contribute in a positive and creative way towards learning at the workplace. It should not be seen as a way of limiting opportunities by focusing only on narrowly-defined basic skills competencies and tasks.

It also assumes that strong partnerships have already been forged among the necessary workplace players--management, the union (if the workplace is unionized), workers and in many cases, an outside educational partner. If these partnerships have not been properly established, then it is fundamental that they be established before attempting to embark on literacy task analysis. Analysts also have a responsibility to report further issues which may arise out of the literacy tasks analysis which cannot be dealt with through training solutions.

These suggestions are not meant to make sweeping generalizations or provide a recipe for conducting a literacy task analysis or subsequent activities which follow from the task analysis. In any given situation, there are various possibilities for conducting a literacy task analysis. The suggestions outlined are meant to provide one example of how a literacy task analysis

could be conducted appropriately given different situations in a variety of workplace cultures. The comfort level of participants in the literacy task analysis and the preferences of the analyst will determine the appropriate techniques.

In order to develop scenarios for each occupational sector, six management (three from non-unionized workplaces) representatives and three union leaders from the different sectors were consulted as to:

* **the culture of their workplace;**
* **present changes their workplaces were going through and the impact of these changes;**
* **the basic skills needed by workers in different jobs;**
* **the perceived need for basic skills upgrading;**
* **training offered and how training needs are assessed;**
* **the viability of literacy task analysis as something both the union and management could co-operate around; what structures are already in place and is there a climate of co-operation between management and labour to carry literacy task analysis through successfully as a joint project;**

* **special concerns and considerations around conducting a literacy task analysis in their workplaces such as safety issues, time constraints, worker-management relations, language barriers.**

The information from these interviews was then used in the development of scenarios to show the applicability of literacy task analysis techniques in a variety of real-life workplace situations. Although the scenarios are hypothetical, they are based on the information given by the representatives of workplaces in the nine occupational sectors. Some occupational sectors include more scenarios than others. This is a result of the information given by the representatives from the nine occupational sectors.

It is clear from interviews with these representatives that a literacy task analysis must be conducted in an atmosphere that respects the dignity and the rights of workers and will not jeopardize their position in any way or in any follow-up activities to the literacy task analysis. Participation through being interviewed or observed must be voluntary. The entire work force needs to be aware of the purpose of the literacy task analysis as well as being a part of the entire process. If they are on side

and have been consulted, the process should go smoothly. In addition, the analyst must take considerable time to ensure that participants involved in interviews and observation feel comfortable and safe with the process.

APPLICABILITY OF A LITERACY TASK ANALYSIS TO A VARIETY OF WORKPLACE SITUATIONS

General Suggestions

Several of the suggestions that follow with reference to conducting a literacy task analysis are based on guidelines from the Technical Report:

* an assessment of training needs, including preliminary interviews with management and labour and input from the work force, needs to be conducted before jobs are selected for a literacy task analysis

* the fundamental steps for conducting a literacy task analysis need to be followed regardless of approach or techniques selected

* the Basic Skills Profile should be used by the analyst before any literacy task analysis is conducted to provide a framework for collecting and analyzing data around workplace basic skills

* interviews can give some direction as to what aspects of a job to observe and when to observe them; however, in other situations it will be impossible to predict exactly when basic skills will be performed, therefore observation is crucial

1. OCCUPATIONAL SECTOR - HOSPITALITY

Hotel X employs a multicultural work force. All non-management employees are unionized except those in clerical positions and banqueting. The hotel is presently embarking on a process to make employees more responsible for decision-making especially in areas of guest contact.

In addition, the Housekeeping Department has introduced a computer system in which room attendants receive information such as instructions on what rooms to clean by reading a computer screen as opposed to getting instructions verbally. A one-day training workshop on the new computer system has been done by the hotel trainer. However, some employees are having difficulty with the new system.

The hotel is interested in offering a specifically targeted training program to assist employees in upgrading their basic skills to use the new computer system. Furthermore, as a result of an organizational review in which all employees were involved, the hotel has identified several other areas in which there is a need to upgrade the skills of the work force in order to accomplish organizational and employee goals.

Firstly, there is the desire on the part of the hotel to provide promotional opportunities into supervisory positions for employees from within areas in housekeeping. Secondly, the hotel and employees see a need to provide opportunities for experienced and skilled room service waiters to move into wait staff (waiter/waitress) positions in the various dining rooms in the hotel.

The hotel has recently updated the job descriptions of all the positions at that property to reflect new responsibilities the hotel expects to be added to their responsibilities.

The union and their management counterpart have a good relationship and have agreed to conduct a literacy task analysis to determine the basic skills needed in four situations. Both management and the union are clear that the process of a literacy task analysis needs to be to be non-threatening, comfortable and voluntary for those who are asked to be involved and that its purpose is understood by the entire work force. Moreover, they are concerned that the techniques chosen take into consideration that multicultural aspect of the work force--language difficulties, and cultural diversity.

Situation 1

Learning New Skills - Room Attendant

Example Procedure

The process that follows and the techniques that are suggested represent only one of many ways that a literacy task analysis could be conducted in this situation.

* Interview the head of housekeeping, the trainer and a room attendant to find out the main tasks in using the new computer system. The trainer can shed some light on where employees are having difficulty with the new system. The INTERVIEW-NOTE TECHNIQUE in which major duties and responsibilities of the position of room attendant are recorded would be particularly useful here. The purpose of the INTERVIEW-NOTE TECHNIQUE is to guide the analyst as to which major duties requiring basic skills should be observed. It also pinpoints what parts of a job to observe. This method would then show how basic skills resulting from the new computer technology are integrated within the tasks and sub-tasks which room

attendants have to perform to complete their jobs. By conducting three interviews, the analyst will ensure better accuracy by having the opportunity to compare and further question the information received. You will also want to examine the training materials to see if they meet the needs of the trainees in terms of their basic skills levels.

This technique also recognizes the expertise of the interviewees and provides the interviewees some ownership to the process. Just as importantly, it provides an opportunity to break the ice and develop a rapport for the observation phase and subsequent follow-up. It may address the concerns of both management and the union that employees involved in the process feel safe and comfortable.

* OBSERVE the room attendant doing the job at a time when basic skills will be performed. Take notes on the major tasks and sub-tasks completed with a more detailed focus on the basic skills related to the new computer system.

* If time allows, attend the training program for the new computer system in order to observe how the program is being taught and any difficulties that employees seem to be having during the course of the training with basic or other skills.

* Compare information from interviews, observation and training. Note discrepancies. use the TASK MATRIX as a framework for analysis. The TASK MATRIX will provide the competencies for each duty. You may also want to compare your information with details included in the job description [1,2] for a room attendant. Go back to the three original interviewees to clarify the areas where there are discrepancies.

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1 Job descriptions should not be used as a primary source of information for a literacy task analysis as they are often not up-to-date or detailed enough to be really useful. However, up-to-date job descriptions can be used for cross-checking information form interviews to make sure all major tasks have been identified in a particular job. They can also be used as a general guide to assist in adapting or formulating questions when using the INTERVIEW-NOTE TECHNIQUE or the STRUCTURED JOB ANALYSIS INTERVIEW.

2 Often an output of a literacy task analysis is a full and comprehensive job description. The TASK MATRIX TECHNIQUE can be used to develop a job description in relation to the basic skills required.

* The BASIC TASK DESCRIPTION TECHNIQUE in which task statements are broken down into task elements and specifically analyzed for basic skills and knowledge requirements would be useful for the task statements that relate to activities that are tied to the new computer system.

* The results of the literacy task analysis can assist in designing a basic skills upgrading program and in conducting the regular training differently. Literacy techniques may be integrated into the training or the training could be adapted to meet the needs of the work force in other ways such as using print materials that are written in plain language.

Situation 2

Learning New Skills - Guest Contact

Example Procedure

* A first step could be to examine the up-to-date job descriptions for guest contact positions for the decision-making and leadership skills that the employer now expects from its employees. This is a situation where the employees are not presently performing the new skills that their employer has identified as necessary to the job. For example, when a customer makes a complaint, the present procedure is for the employee to meet the manager. The manager listens to the complaint and makes a decision. In the future, the employer wants the employee to handle customer complaints themselves.

* The STRUCTURED JOB ANALYSIS INTERVIEW administered to managers will provide information on the new skills required for guest contact positions especially in what situations an employee needs to address customer complaints. This information can be obtained through

questions dealing with guest contact situations and customer complaints in particular. Information from the job description could assist in ensuring that critical areas are covered in the interview with a particular emphasis on leadership and decision-making skills under "Contact with Others".

* Managers in guest contact areas should be interviewed according to the tasks and skills they now expect in guest contact positions. An employee in each guest contact position can be interviewed using the STRUCTURED JOB ANALYSIS INTERVIEW with a focus on determining the basic skills they presently use particularly in situations where there is guest contact.

* The employees should be OBSERVED so information from the observation and interviews can be compiled into a list of major tasks and sub-tasks; task statements could then be developed.

* In follow-up interviews with the original interviewees where task statements are verified, the RISK ASSESSMENT TECHNIQUE can determine the perception of the importance and difficulty of different tasks.

* The FLOW CHART TECHNIQUE could be used to analyze the information from the managers' interview and to illustrate the steps and skills of how a customer complaint should be handled. This information would need to be verified with them in a follow-up interview.

* A comparison could then be made between the actual skills and tasks and the expected skills and tasks, and as well as management and employees' perceptions of the importance and difficulty of these. The gap between the two would provide the areas where management needs to orient and/or train employees.

* Again, the literacy task analysis can assist in the development of training for staff in guest contact positions who will be required to take on new responsibilities which require new skills.

Situation 3

Promotability - Back of the House (Non-Guest Contact Positions)

Example Procedure

* A comparison of the basic skills needed to move from the non-supervisory to the supervisory positions is necessary.

* Both selected supervisors and employees could be interviewed using the INTERVIEW-NOTE TECHNIQUE and then the information analyzed within the framework of the TASK MATRIX. The INTERVIEW-NOTE TECHNIQUE is simple and easy to use especially where there may be language barriers in interviews with workers in back of the house positions. It can be structured to address the language skills of participants. In addition, since these jobs do not require the more sophisticated basic skills, the TASK MATRIX will provide enough detail.

* The information gleaned from the matrix for the staff and supervisory positions could be easily compared as to the necessary basic skills needed to move from one job to the other.

* If appropriate, the DAILY LOG could be used to verify and supplement the information received in the supervisor interview. Alternatives to observation in the back of the house situation should seriously be considered given that often many employees speak little English. Therefore, even with translation and the best explanations there may be grave misunderstandings about why employees are being observed.

  In this case, jobs that staff would be promoted to are the more important ones to observe because of the higher level of complexity in terms of basic skills required. Therefore, observation-interviews with selected supervisors may be appropriate.

* Follow-up interviews could then verify the analyst's task statements focusing on basic skills for supervisory and staff positions.

Situation 4

Promotability - Room Service to Dining Room

Example Procedure

* A comparison of the basic skills needed for a room service wait staff and a dining room wait staff is necessary.

* Both selected supervisors and employees could be interviewed using the JOB LEARNING ANALYSIS SCORING GRID.

The Grid provides both the areas for questioning and is an instrument with which the responses can be analyzed. The Grid will indicate the similarities and differences between the two jobs and provide comparability. Time spent on activities and the accuracy of the grid can be verified in follow-up discussions with interviewees. The Grid will specify the task and skills differences between these two jobs where there are many skills and activities in common. Working in the dining room clearly requires a higher degree of communication skills and is desired because of added prestige and money.

* The GRID will identify the basic skills that are displayed throughout the many aspects of the job and provide some direction for observation (those duties which require the greatest amount of basic skills).

* Information can be verified and enhanced through OBSERVATION.

* Again, information from the interviews and observation can be checked against job descriptions and discrepancies verified in follow-up discussions with interviewees.

2. OCCUPATIONAL SECTOR - EDUCATION

An educational institution has recently begun to implement computer systems that will be used by the support staff--those in clerical and secretarial positions. These systems will replace many of the manual, clerical functions including filing and storing information. In addition, many staff will be taking on the word processing function. Although some staff have had training, it has not been enough and they are unable to use the new systems. Although manuals have come out, staff have been unable to use them because the directions are unclear. There is concern on the part of the union and management that some staff may need basic skills upgrading as well as further computer training to operate the new computer systems.

In addition, although no formal needs assessment has been done, each department has been told that they have to conduct their own assessment as part of their strategic planning for the upcoming year. Job descriptions have not been audited for ten years and do not accurately reflect what people do on the job.

The union has noted a need for basic skills upgrading in other areas as well and is planning to canvass its members to see their

interest and desire for union-sponsored programs. The working relationship between management and the union is good and both are interested in finding a solution to address the issue of the changes at the workplace which are presently impacting on workers and their jobs.

Job-shadowing, where one employee actually observes and works with another employee in a different job, has been a regular part of professional development for staff in the organization. Therefore, management and the union feel that a literacy task analysis will not be a problem. However, there is a concern that some people may not want to be observed and that therefore this aspect must be voluntary.

Situation 1

Learning New Skills - Support Staff:
Clerical and Secretarial Positions

Example Procedure

* Since no needs assessment has been conducted within this organization, the analyst could start with the INTERVIEW-NOTE TECHNIQUE with both a supervisor and selected employees to identify the main duties performed by a clerk and get a feel for the job. This information could be analyzed within the framework of the TASK MATRIX. The TASK MATRIX would provide a good overview of the duties performed and the competencies for each duty.

* OBSERVE selected employees especially at a time when they are working with the computer. This will provide an actual look at the actual basic skills required rather than just the perceived basic skills.

* Write task statements. Then use the BASIC TASK DESCRIPTION TECHNIQUE to isolate the basic skills needed for each task element with a special focus on those required to use the computer.

* Examine technical manuals for their usability. For example, are they clear and complete? Do they follow the principles of clear language? Cross reference the degree of skill required to use the manual with what you have discovered through interviews and observation.

* This method of approaching a literacy task analysis will give a detailed breakdown not only of the necessary basic skills but the broader computer and other skills needed to respond to changing technology at the workplace.

* The literacy task analysis will point the way toward strategies to address this situation of changing technology. Strategies may include basic skills and other training as well as a reorganization of work and adaptation of print materials to be more user-friendly.

3 OCCUPATIONAL SECTOR - FINANCIAL

A data processing operations and systems development division of a large financial institution is responsible for developing and programming new computer systems as well as maintaining information systems. Different jobs in the division consist of highly skilled computer programmers, data entry clerks, systems analysts, and clerical and administrative support staff. The division is a highly technical area and as a result technology is changing all the time. Employees have to adapt to new systems, software, hardware and continually update their knowledge. Training and group learning are ongoing.

As a result of an internal assessment, the division has identified two areas of concern for basic skills upgrading. Firstly, a large percentage of the computer programmers are newcomers to Canada. Although their technical and reading and writing skills in English are excellent, there are breakdowns in oral communication due to language and cultural differences among the programmers themselves and their supervisors and between departments.

In addition, trainers have identified that in many cases, training courses offered by the department do not have the desired impact because of a lack of understanding.

Secondly, the division, which has a policy to promote from within, has noticed that it is difficult to promote employees in data entry positions to other positions within the division. Often employees are not able to participate in training available for word processing, other clerical positions and computer programming positions because of a need for a higher level of basic skills.

Situation 1

Learning New Skills - Computer Programmers

Example Procedure

* Given the complexity of the skills required by computer programmers in this workplace, the analyst could begin with an adapted version of the STRUCTURED JOB ANALYSIS INTERVIEW. This would give a good, detailed overview of the entire job. Both a supervisor and computer programmer would be interviewed using this technique. Task statements would then be written as a result of these interviews.

* In this situation, it is essential to find out the importance of oral communication with others vis-a-vis the technical aspects of the job. Therefore, the JOB FUNCTION TECHNIQUE would provide useful information here. The analyst would use this technique to categorize specific tasks as to whether they are information functions, people functions or things functions. This would show the true importance of people functions versus the other functions. This analysis should then be checked with the interviewees.

* Since oral communication is the concern, observation should occur when the programmer is involved mainly in people functions. OBSERVATION should provide more details on the oral communication skills needed by programmers. In addition, the DAILY LOG could work well here, where the programmer keeps track of the specific tasks related to people functions that are performed. This information could then be checked against the information collected through other methods.

* The literacy task analysis will assist in the design of a communications training program for computer programmers.

Situation 2

Promotability - Data Entry Clerks

Example Procedure

* The analyst can begin by using the INTERVIEW-NOTE TECHNIQUE with workers and supervisors for positions being examined, namely the data entry position and the other positions to which the company wishes to promote the data entry clerks.

* Information from these interviews should be placed in chart form using the TASK MATRIX for each position. The JOB LEARNING ANALYSIS SCORING GRID can be used as an alternative to the combination of INTERVIEW-NOTE TECHNIQUE and TASK MATRIX. In this way, the analyst can compare skill differentials that are needed to move from data entry clerk to other positions.

* OBSERVATION of jobs that the data entry clerks can be promoted to will enhance the quality of information to determine task statements for these jobs.

* The BASIC TASK DESCRIPTION TECHNIQUE can be used here to isolate the basic skills needed for each task element within a task statement. These will need to be verified with the employees and supervisors who participated in the original interviews.

* The literacy task analysis will assist in any training that is offered to employees to assist them in meeting their career goals through transfers and promotions.

4 OCCUPATIONAL SECTOR - RETAIL

The management of a department store has recently stream-lined its staff. As a result, the store expects the remaining staff to be more responsible for customer service in terms of handling customer requests, doing suggestive selling and addressing customer complaints without having to consult with management each time. Although some training has taken place on an ad-hoc basis in staff meetings, no formal assessment or training program has taken place to address these new organizational goals.

In addition, the store is concerned that its staff have become too reliant on "equipment" such as computers to do basic math. Several times when the power has gone off, employees have been unable to figure out discounts, do basic addition on bills and even make change.

The store is interested in conducting a literacy task analysis to isolate the basic skills needs in these two situations. However, they are concerned about the time this kind of assessment may take given that the store is already short-staffed and both staff and management have had to take on greater work loads as a result.

Situation 1

Learning New Skills - Clerks in Retail

Example Procedure

* Given the time constraints and staffing issues in this workplace, the STRUCTURED JOB ANALYSIS INTERVIEW would be advisable to use. One supervisor and one sales clerk can be interviewed using interview questions that are adapted to the workplace situation.

* This technique can provide information as to both the customer service skills and the math skills required by sales clerks. Although observation is advisable, it may not be possible in this situation due to extreme time constraints faced by the organization. However, an OBSERVATION-INTERVIEW TECHNIQUE may be useful.

* Information from these interviews can be analyzed according to the TASK MATRIX--one chart based on the perceptions or observations of management and one based on the perceptions or observations of the sales clerk.

* The chart can be verified with the participants in follow-up interviews. The resulting framework of duties and competencies can provide a starting point for further input, orientation and workshops.

5 OCCUPATIONAL SECTOR - MANUFACTURING

An electronics company is concerned about the quality of electronic communication amongst its staff in one of its major labs where its most important manufacturing line is located. Key positions in this lab include processing engineers, equipment technologists and operators. Process engineers are responsible for developing and sustaining the manufacturing process. Equipment technologists maintain the equipment in terms of both software and hardware on the line and make modifications to the equipment where necessary. Operators are responsible for running the equipment. The smooth running of the line depends on excellent communication and teamwork among these three groups. Almost all communication among employees in the lab is done electronically from one computer to another. However, often messages are misunderstood because they have not been written clearly, they are sent anonymously or the tone of the message is offensive to the receiver. This situation has led to conflict among the three groups and delays and problems on the line.

The company is interested in conducting a literacy task analysis in this specific situation to find out how communications

could be improved. Job task analyses and internal needs assessments have been conducted by an internal staff person in the lab before. In these cases, some employees who were asked to be involved were distrustful of the process. They felt that the process was really just an efficiency study conducted by management to find out how well they were doing their jobs. However, the staff person was able to relieve their concerns about the purpose of the assessment.

The company feels that this issue will not arise with an outside person. However, they are concerned about preparing the outside educational partner to go in the lab. The lab has very strict guidelines concerning dress and behaviour. Training to even enter the lab will take at least half a day. The other concern that the employer has is the ability to convince supervisory staff of the need to conduct the analysis. They tend to think that these exercises are a waste of time.

Situation 1

Learning New Skills - Process Engineers, Equipment Technologists and Operators

Example Procedure

* Both supervisors and the work force need to be involved and on side for the literacy task analysis to go smoothly. Therefore, it would be important to meet with supervisors and workers to hear their concerns and explain the purpose. Their input can be solicited as to the best way of scheduling the analysis and making people feel comfortable about the process.

* The INTERVIEW-NOTE TECHNIQUE or the STRUCTURED JOB ANALYSIS TECHNIQUE can be used to conduct interviews with representatives from all three job categories and a management representative.

* Given that the focus is on teamwork and group communication, the FLOW CHART TECHNIQUE can be used to map out how the different groups communicate with each other electronically and otherwise and how they must work together as a team. The flow chart can be developed from information received in the interviews.

* The flow chart can be verified with the interviewees for accuracy in follow-up discussions.

* A sampling of messages that have been sent among the different groups should be analyzed for their clarity and tone and possible impact on the receiver.

* Basic skills and knowledge can be listed for each task element that come from task statements on the flow chart and later used as a training aid.

* Considering that it will be very time consuming to observe in the lab, observation may not be appropriate in this situation.

* The literacy task analysis can assist in developing better communications among these three groups through training or guidelines for communications.

6 OCCUPATIONAL SECTOR - NATURAL RESOURCES

Union and management in a gold mill have identified a need to bridge the gap between the workers' basic skills and the new Common Core Mill training which has recently been developed jointly by labour, management and government. All mill employees are required to take the training which, divided into modules, covers the major areas in milling. Participants are required to do a lot of reading and writing in the course as well as completing end-of-module tests. At the completion of the training, participants get a certificate from the government. All mill workers must complete the competency-based training program. The company and its union counterpart are interested in ensuring that all workers have equal opportunity to succeed in the training.

They have agreed to conduct a literacy task analysis to identify the basic skills needed to participate in and complete the Common Core Mill training program and improve relevance of course material to the basic skills of the participants. At this point, they are looking at a combination of strategies that may result from the analysis to improve access to training for workers including revamping the training to meet the needs of the work force. In this situation, then, the area where there is a need to analyze the basic skills needed is the training program itself as opposed to the basic skills needed within specific jobs.

Situation 1

Using A Literacy Task Analysis to Ensure Equal Access to Training Opportunities

Example Procedure

* The best place to start would be to use the TASK MATRIX with the trainer to find out what major tasks and competencies form the Common Core Mill training program. The trainer can also shed light on the kinds of difficulties around basic skills workers may be having with the training. The trainer can also provide the print materials used in the training. These materials should be examined by the analyst.

* This information can be analyzed according to the BASIC TASK DESCRIPTION TECHNIQUE. This technique has been chosen as it will be important to get very detailed information on the basic skills needed for different task elements in the training.

* It will be essential to OBSERVE the training program several times to determine what basic skills are required

by participants and whether the training program is tailored to the needs of participants and their skills levels.

* Information from observation of training can be added to the analysis already completed. The analysis can be verified with the trainer.

* The literacy task analysis can assist in determining literacy techniques to be integrated into the Common Core Mill training program, ways to adapt the training so it contains less print material and is more suitable for the target audience and some areas that could be included in a basic skills upgrading program.

7 . OCCUPATIONAL SECTOR - TRANSPORTATION

An urban transit company with a strong training culture, is interested in providing basic skills upgrading opportunities for its bus operators. In addition, it has recently implemented a comprehensive, customer service training program and feels that

many of its older workers might feel more comfortable in the training if they were provided with the opportunity to upgrade their reading and writing skills.

Although the company has recently attempted to offer a voluntary basic skills upgrading program, the response to the program has been very low. Given the difficulty in reaching people, the company wants to try a new strategy. One option it is considering is to integrate basic skills into the customer service program to assist those workers who may be having difficulties with it.

An extensive job analysis has already taken place within the organization with the co-operation of workers who volunteered to be a part of the process. The company is interested in working with established management-union committees to implement a literacy task analysis to find out if training needs to be adjusted to meet the needs of older workers.

The company is concerned with making the process as non-threatening as possible for those involved and is also concerned about time constraints given an already heavy commitment to training and assessment.

Situation 1

Using Literacy Task Analysis to Ensure Equal Access to Training Opportunities

Example Procedure

* Since time constraints are a concern for the company, it is important to choose a route that requires little time on the part of the company while yielding maximum information.

* In this situation, it would be advisable to interview the appropriate management and union contact in the company to find out the main tasks and basic skills required for good customer service. An operator should also be interviewed. In all cases, the INTERVIEW-NOTE TECHNIQUE is the simplest and least time-consuming technique to use.

* This information can be placed on the TASK MATRIX in order to readily see the duties around customer service and the basic skills competencies needed for these duties.

* The trainer of the customer service program should be interviewed to help identify where participants have difficulty with the training due to basic skills issues. This information can be further broken down using the BASIC TASK DESCRIPTION TECHNIQUE in order to isolate the basic skills and knowledge needed to complete the customer service training.

* The analyst can examine the training material and observe the customer service training to further supplement the information gleaned from other sources.

* Analysis of information from all three interviews will need to be verified in follow-up discussions with original participants. The rationale for analyzing tasks as they relate to customer service skills needed by the operator is to allow the analyst to make valid suggestions as to how the training could be adapted to meet the needs of participants and how basic skills techniques could be integrated into the training.

8 OCCUPATIONAL SECTOR - CONSTRUCTION TRADE

Recently, one of the construction trade unions has begun to set up a training centre. The union is preparing to assess the needs and requirements of the trade which includes three categories of jobs--very skilled, semi-skilled and manual. There is concern that basic skills upgrading needs be isolated and addressed through programs offered at the new training centre. It is apparent, since there are no minimum requirements to enter the trade, that many members are unable to read print material related to occupational health and safety. As well, many are unable to complete the blue print reading course which would help them move on to better paying jobs.

In addition, new technology has been introduced into the very skilled job functions where many tasks are completed electronically with the use of computers. Along with this new technology, the tradesperson is required to work closely with other skilled tradespeople to complete the job.

The union is working to address these training issues through a joint partnership with management. As such, they are interested in conducting a literacy task analysis to design training programs which will address the basic skills upgrading needs of their workers.

Situation 1

Using a Literacy Task Analysis to Ensure Basic Skills are Addressed as Part of a New Training Strategy

Example Procedure

* Both selected supervisors and workers for each of the three job categories could be interviewed using the JOB LEARNING ANALYSIS SCORING GRID. The Grid provides both the areas for questioning and is an instrument with which the responses can be analyzed. The Grid will indicate a skills progression among the three job categories and at the same time provide enough detail for each job category onto itself.

* The analyst should OBSERVE the three workers interviewed, if possible.

  Safety considerations may curtail observation especially on construction sites where an analyst may have to observe from great heights. In addition, a worker may have to be tracked for a long time to get a real sense of the basic skills needed for the job especially in the case of both the manual and semi-skilled job categories.

* Follow-up interviews with participants in the task analysis will verify information contained in the grids for the three areas being analyzed.

* Information from the grids can be further broken down to isolate the basic skills needed for each category using the BASIC TASK DESCRIPTION TECHNIQUE.

9. OCCUPATIONAL SECTOR - HEALTH CARE

A large, urban hospital with a well developed training culture has just completed an overall staff assessment of training needs. In the process, it has become apparent that there is a need to provide upgrading in reading and writing for its supervisory staff in the Housekeeping Department. The supervisory staff, by and large, are middle-aged women and long-term employees who have worked their way up to their present positions. The hospital is interested in integrating a basic skills component into a new course which has just recently been developed for supervisory staff in Housekeeping. Housekeeping supervisors need to be able to complete numerous forms and reports and interpret and understand

several collective agreements. In addition, there are other ongoing reading and writing tasks required of supervisors in their positions.

The hospital is interested in using a literacy task analysis as one way they can further understand what the reading and writing skills needed by the supervisors are and how they might be integrated into the existing program.

Situation 1

Using a Literacy Task Analysis to Integrate Basic Skills into a Supervisory Program

Example Procedure

* The analyst could start off by using the INTERVIEW-NOTE TECHNQUE. By interviewing both a supervisor and the supervisor's manager, it will be possible to get a good overview of the job and the basic skills needed on the job.

* Next, the analyst should OBSERVE the supervisor on the job.

* In addition, the analyst will need to examine the forms, collective agreements and other materials supervisors use in their jobs.

* Then the analyst could use the JOB FUNCTION TECHNIQUE to analyze the information received from the interviews. The JOB FUNCTION TECHNIQUE would provide useful information here. The analyst would use this technique to categorize specific tasks as to whether they are information functions, people functions or things functions.

  This would be important to find out the percentage of time spent on reading and writing vis-à-vis other activities within the context of the whole job.

* Then the BASIC TASK DESCRIPTION TECHNIQUE can be used to isolate the basic skills needed for each task element within a task statement.

* The analysis will need to be verified with the supervisor and manager who participated in the original interviews.

* The literacy task analysis can then contribute to what reading and writing skills can be integrated into the supervisory program and the proportion of time that should be spent on developing these skills within the context of other supervisory skills.

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